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UNITED STATES DEPARTMENT
OF COMMERCE

HENRY A. WALLACE, *Secretary*

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UNITED STATES DEPARTMENT OF COMMERCE
OFFICE OF TECHNICAL SERVICES

BIBLIOGRAPHY
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LIST OF ABBREVIATIONS

BELOW ARE LISTED ABBREVIATIONS USED IN BIBLIOGRAPHY FOR THE NAMES OF GOVERNMENTAL AGENCIES AND OTHER ORGANIZATIONS ISSUING REPORTS.

AAF	ARMY AIR FORCES.
AFETO	ARMY FORCES IN THE EUROPEAN THEATER OF OPERATIONS.
AFMPAC	ARMY FORCES IN THE MIDDLE PACIFIC.
AFMTO	ARMY FORCES IN THE MEDITERRANEAN THEATER OF OPERATIONS.
AFPAC	ARMY FORCES IN THE PACIFIC.
AFSPAC	ARMY FORCES IN THE SOUTH PACIFIC.
AFSWPAC	ARMY FORCES IN THE SOUTHWEST PACIFIC.
AMC	AIR MATERIEL COMMAND.
ATI	AIR TECHNICAL INTELLIGENCE.
ATIC	ARMY TECHNICAL INTELLIGENCE CENTER.
ATSC	AIR TECHNICAL SERVICE COMMAND.
BIGS	BRITISH INTERROGATION OF GERMAN SCIENTISTS.
BIOS	BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE.
CHLOR-FAKO	CHLOR-FABRIKATIONS KOMMISSION.
CIOS	COMBINED INTELLIGENCE OBJECTIVES SUB-COMMITTEE.
CPA	CIVILIAN PRODUCTION ADMINISTRATION.
CWS	CHEMICAL WARFARE SERVICE.
EEIS	ENEMY EQUIPMENT INTELLIGENCE SERVICE.
FB	FORSCHUNGSBERICHT.
FIAT	FIELD INFORMATION AGENCY, TECHNICAL
IBT	INDIA-BURMA THEATER.
JDL	JAHRBUCH DER DEUTSCHEN LUFTFAHRTFORSCHUNG.
JIOA	JOINT INTELLIGENCE OBJECTIVES AGENCY.
KUKO	KUNSTSTOFF KOMMISSION.
KUTEKO	KUNSTSTOFF-TECHNISCHE KOMMISSION.
NDRC	NATIONAL DEFENSE RESEARCH COMMITTEE.
NAVAER	NAVY DEPARTMENT BUREAU OF AERONAUTICS.
NAVCG	NAVY DEPARTMENT COAST GUARD.
NAVDOCKS	NAVY DEPARTMENT BUREAU OF YARDS AND DOCKS.
NAVORD	NAVY DEPARTMENT BUREAU OF ORDNANCE.
NAVPERS	NAVY DEPARTMENT BUREAU OF PERSONNEL.
NAVSHIPS	NAVY DEPARTMENT BUREAU OF SHIPS.
OPRD	OFFICE OF PRODUCTION RESEARCH AND DEVELOPMENT.
OSRD	OFFICE OF SCIENTIFIC RESEARCH AND DEVELOPMENT.
QM	QUARTERMASTER CORPS.
QMB	QUARTERMASTER BOARD.
SCAP	SUPREME COMMANDER FOR THE ALLIED POWERS.
SHAEF	SUPREME HEADQUARTERS ALLIED EXPEDITIONARY FORCES.
SIG CORPS	SIGNAL CORPS.
TIIC	TECHNICAL INDUSTRIAL INTELLIGENCE COMMITTEE.
UM	UNTERSUCHUNGEN UND MITTEILUNGEN.
WPB	WAR PRODUCTION BOARD.
ZETKO	ZWISCHENPRODUKTE KOMMISSION.
ZWB	ZENTRALE FÜR WISSENSCHAFTLICHES BERICHTSWESEN ÜBER LUFTFAHRTFORSCHUNG.

CHEMICALS AND ALLIED PRODUCTS

Drugs and Pharmaceuticals

PB 30753. I. G. FARBENINDUSTRIE A. G., WUPPERTAL - ELBERFELD. Barbiturates prepared by the I. G. Farbenindustrie plant, Elberfeld. n.d. 343 p. Price: Microfilm-$5.00 - Photostat-$17.00
Slips of paper are grouped under seven classes of compounds, each slip having a structural formula for the barbiturate compound with notations as to its narcotic effect upon cats and dogs. The classes presented are: C - C-dialkyl; C - C-alkyl - aryl; C - C-dialkyl - N-alkyl-aryl; C - C-alkyl-aryl - N - N-alkyl-aryl; varia; C - C-aryl-alkyl - N-aryl-alkyl; and thio compounds. This document forms a portion of the material presented under PB 1663, abstracted in this bibliography, v. 1, p. 752.

Dyes

PB 36758. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, IND. Color fastness of O.D. #7, dyed nylon duck. (Rept 157) May 1945. 13 p. Price: Microfilm - $1.00 - Photostat - $1.00
Incorporation of dyed nylon into the specification for fabrication of the jungle boot has placed increased emphasis upon requirements for color fastness of this material. Preliminary examinations at this depot were concerned with visual changes in color by comparison of test-faded swatches with the original cloth. Results of 100-hour weathering and 180°F. washings were used as a basis for establishing requirements of specifications for nylon duck. Conclusions are made with respect to the relative color fastness of grey nylon duck, dyed by various finishers, identification of whom is withheld. The color changes produced in samples submitted in fastness to light tests are given. Tables and graphs are included.

PB 36751. U.S. QUARTERMASTER DEPOT, JEFFERSONVILLE, IND. The use of Poly-tint dyes for coloring clear plastic lenses. (Rept 190) Jun 1945. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report deals with the use of poly-tint dyes for coloring clear cellulose acetate lenses currently mounted in goggles, M-1944. The dyes have been recommended for use on transparent, translucent, or neutrally opaque plastics but no information has been forthcoming concerning their use on lens material. Procedures are described. It is concluded that poly-tint dyes are not feasible for coloring clear cellulose acetate lenses currently supplied with goggles, M-1944, because their use results in lenses of poor quality. They are also found impractical for one of the coated plastics now under investigation as a possible material for lenses. Tables and graphs are presented in an appendix.

Agricultural Chemicals

PB 20425. ENNIS, W. B. and others. Tributyl phosphate as a solvent for preparing concentrated and oil miscible solutions of 2, 4-dichlorophenoxyacetic acid and similar substances. 1945. 2 p. Price: Microfilm-$0.50 - Photostat-$1.00
At ordinary temperatures tributyl phosphate will dissolve up to 36 percent, by weight of 2, 4- dichlorophenoxyacetic acid. A solution of from 5 to 36 percent of this weed-killing compound dissolved in tributyl phosphate, was found to be convenient and use ful for subsequent dilution with kerosene, or low grade fuel oil for use as a spray.

PB 34741. LEA, F. M. Interrogation of Dr. Loahfert (Rhenania Phosphat Werke, Brunsbüttelkoog, Germany) at the Building Research Station Department of Scientific and Industrial Research, and at Crown Works, Strood. (BIOS Final Rept 582, Item 22) Sep-Nov 1945. 9 p. Price: Microfilm - $1.00 - Photostat - $1.00
Dr. Loahfert had been previously interrogated regarding the manufacture of phosphate fertilizer. (See BIOS Final Report 94, PB 18913, page 1286, Vol. I, this Bibliography.) Very little supplementary information was obtained during the course of the present interrogation, but Dr. Loahfert emphasized the importance of accurate control of raw materials. Details of the laboratory control and the feeding of the materials and the burning were obtained. A table gives the production costs per Kg of P_2O_5. The appendix lists the following: (1) Determination of the fluorine in raw phosphates, Wrenzius-Overmann method; (2) determination of lime as calcium oxalate by titration in raw phosphate, raw powder and clinker; (3) determination of SiO_2 in the raw phosphates, raw powders, sand and clinker in the decomposition product; (4) determination of sulfur in raw powder by the benzidine method using sodium sulfate.

PB 34038. MACMURRAY, H. D. and MATHER, E. German pest control industry: Pflanzenschutz-Stähler, Erbach-Rheingau. (BIOS Final Rept 464, Item 22) May 1946. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
Information was obtained regarding the firm's plant - protection compounds. Pomona Stembemittel is a dusting powder based upon nicotine and pyridine; Pomona Blattlausmittel is a concentrated nicotine spray fluid of normal composition; Pomona Baumwachs is a grafting wax. A few other products are briefly described. The investigators concluded that the firm's methods of manufacture or products were in no way novel.

Plastics and Plasticizers

PB 34032. CRAWFORD, J. W. C. and LOVE, T. Investigation of German plastics plants; Part 4. Additional information on thermosetting resins and processing of polystyrene. (BIOS Final Rept 433, Item 22) Sep-Oct 1945. 97 p. Price: Microfilm - $2.00 - Photostat - $7.00

The following firms were visited during the course of the investigation: Bisterfeld and Stolting plants at Radevormwald and Egerpohl, Rhein Province; Dynamit A.G., Troisdorf and Krimmel. Information was obtained regarding phenolic and urea and melamine-formaldehyde molding materials. The preparation of pulp for filler and the operation of the Schmidt-Bisterfeld hot needle testing apparatus are described. This machine is used for measuring the penetration of a heated needle into a phenolic molding material. The report also describes the preparation of laminated materials and phenolic glues. The extrusion of thermosetting materials and the processing of polystyrene is dealt with. Appendix I consists of working drawings for Schmidt-Bisterfeld apparatus and Appendix II describes the analysis of pyrocatechol. Photographs and diagrams illustrate the various phases of the investigation.

PB 33273. KLINE, G. M. and CALLOMON, I. G., trs. Manufacture of laminates in Germany. n. d. 20 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report covers the preparation of phenolic paper-base and fabric-base laminates and of paper and fabric sheet materials for molding materials. The I. G. paper-base laminates are marketed under the trade name of "Trolitax". The composition, processing conditions and applications of the various types are tabulated in Table I. Similar data for the fabric-base laminates, which are known as "Dytron", are presented in Tables II and III. The phenolic resin-impregnated fabrics which are used to mold laminated parts are described in Table IV; they are classified as "Trolitan" products along with the other I. G. phenolic molding compounds. The preparation of "Dynal", a pulp-sheet molding material is described. Laminates made with urea-formaldehyde resins are designated by the trade name "Pollopas" by I. G. The preparation of a laminate of this type is covered in Table I. The manufacture of the urea-formaldehyde resin is also described in this report. A diagram of the vertical coating machine and the horizontal coating machine are included.

PB 36780. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, IND. A comparison of the mar resistance of coated and uncoated cellulose acetate. (Rept 130) Feb 1945. 6 p. Price: Microfilm - $1.00 - Photostat - $1.00
This report deals with a comparison of the resistance to marring exhibited by samples of coated and uncoated cellulose acetate used for plastic sunglass lenses as evidenced by results of the falling abrasive, pencil hardness, sheer hardness and rubbing abrasive methods. Test procedures are described, and results tabulated. It is concluded that: (1) The coated cellulose acetate tested in this report exhibits greater resistance to marring than does the uncoated material; (2) the coated cellulose acetate when compared with plastics and glass examined shows less permanent damage due to falling carborundum than does glass or any of the plastics; (3) the coated plastic requires a greater load to cause initial marring by a particle moving across its surface than does any of the other plastics encountered; (4) the coated plastic is not as resistant as methyl methacrylate to particles moving across its surface under heavy load nor is its pencil hardness as great; and (5) the coated plastic is exceeded by the commercial resin in resistance to abrasive rubbed over its surface but the total effect on both is very small.

PB 36783. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, IND. Properties of plastic sheeting suggested for tent windows. (Rept 123) Feb 1945. 6 p. Price: Microfilm - $1.00 - Photostat - $1.00
The material in present use for tent windows is a ¼ inch string mesh laminated between two thin sheets of cellulose acetate. One of the undesirable properties of this material is its tendency to tear and split. It was thought that a study of other plastic sheeting might reveal a material more suitable for this purpose. Two samples of polyvinyl and five samples of polyethylene and one sample of cellulose acetate were submitted for testing. It is concluded that (1) In considering an individual plastic, a pressed polished finish is better suited for tent windows than is a calendered finish; (2) reinforcements of the plastic sheeting should be as flexible as the sheeting; (3) cellulose acetate is not satisfactory for use in a tent which must be folded or rolled up; (4) the polyvinyl and polyethylene types covered in this report do not appear to be better suited for tent windows than the present material in use; and (5) none of the samples were significantly affected by outdoor exposure for two months. Exposure to ultraviolet light for 200 hours produced little effect on the polyethylene and cellulose acetate sheeting but caused severe warping of the pressed polished polyvinyl and numerous small brown areas in the calendered polyvinyl. Tables are included.

PB 36769. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, INDIANA. Reports on the determination of mar resistance of plastic lens material. (Rept 15) Jul 1944. 28 p. Price: Microfilm-$1.00 - Photostat-$2.00
Four methods of evaluating mar resistance of transparent plastic sheetings were investigated using eleven commercially available plastics, and a plate of window glass for reference. It was found that two apparently different hardness characteristics are involved, namely: (1) Resistance to surface hazing which may be evaluated either by the falling abrasive method or the rubbing abrasive method; (2) resistance to scratching which may be evaluated either by the pencil hardness method or the shear hardness method. Of the plastics tested, the commercial resin possesses the highest resistance to surface hazing, whereas methyl methacrylate plastic offers the highest resistance to scratching. Cellulose acetate sheetings of the types employed in the present goggles exhibit lower resistance to both types of marring. Appendix I presents methods of determining mar resistance detailed in the literature, and list of references. Appendix II consists of photographs, and appendix III of tables and graphs.

Paints, Varnishes and Lacquers

PB 33378. BARNETT, C. E. and HUNDLE, G. W. Luminescent markings for ammunition and other supply cases to provide legibility under blackout conditions. Progress report, Nov 23, 1942-Mar 26, 1943. (OSRD Rept 2020) Mar 1943. 17 p. Price: Microfilm-$1.00 - Photostat-$2.00
Experiments with a phosphorescent writing chalk, a fluorescent crayon for marking dark-colored ammunition storage and shipping cases, and a fluorescent paint for stenciling identification markings on stained wood or asphaltum impregnated paper, ammunition storage, and shipping cases carried on in the Research Division of New Jersey Zinc Company (of Pa.), though discontinued before a completely satisfactory conclusion had been reached, revealed favorable possibilities in the use of luminescent markings for shipping containers for ammunition, etc., which must be handled under blackout conditions.

PB 31251. PALMER, G. and others. German aircraft paints. Oct-Nov 1945. (BIOS Final Rept 366, Item 22) Mar 1946. 48 p. Price: Microfilm-$1.00 - Photostat-$4.00

This report concerns an investigation of the German aircraft paints industry in the British Zone. The investigation was also intended to cover sealing compounds used for high-altitude aircraft with pressurized cabins. Information was obtained on test methods and relevant special apparatus. In general, German aircraft paints and dopes were made by a number of firms to whom the recipes and special materials were supplied. Technical information, including recipes and literature, and samples of finished products and raw materials were obtained. The targets visited are listed. At nearly all targets reference was made to substitute drying oils, linseed oil and particularly china wood oil being in poor or indifferent supply. Dehydrated castor oil and tall oil products from Swedish sulphate wood pulp were used. Oiticicia oil was imported from South America. For quick drying paints extensive use was made of synthetic resins including nitrocellulose, urea, melamine and phenol formaldehyde, oil modified PF, oil modified alkyd, etc. The policy of the suppliers of all those special synthetic products appeared to be to withhold from the sub-contractors essential information on composition and to modify this where necessary in the light of complaints from the customer firms. The manufacturers visited did not supply aircraft paints exclusively but also supplied products for a wide range of customer requirements. Formulae for paints obtained from the firms are included in appendices to this report. Among the items which received special interest were "Polystahl", a resin that could be used either as an adhesive or as a paint resin, enabling painted surfaces to be glued together or paint to be applied over glue-contaminated surfaces. Also treated are fireproof paints and dopes, lacquers for stamping, nitrocellulose and other cellulose ester dopes, protection of wooden aircraft, heat reflecting paints, gasoline resistant paints, paints for metal aircraft, camouflage paints and sealing compounds. A spot welding flux for ferrous metals was made by Herbert under the trade name "Standoplast". This consisted essentially of synthetic fatty acid from the Fischer-Tropsch process carried out at Witten.

Inorganic Chemicals

PB 34029. CLAYTON, J. H. A. G. für Chemische Industrie, Gelsenkirchen-Schalke (a controlled subsidiary of the I. G.). Manufacture of carbon bi-sulphide. (BIOS Final Rept 428, Item 22) Oct 1945. 14 p. Price: Microfilm-$1.00 - Photostat-$1.00

The report describes the production of carbon bisulfide. A good grade of yellow sulfur is used since a poor grade would cause trouble in the pre-vaporisers. Good grade wood charcoal of beech or birch wood with an ash content of 3% is also used. The report describes the formation of the CS_2, condensation, CS_2 recovery from the gas, and the refining of the crude CS_2 by distillation. A description of the equipment is given. A flow sheet illustrates the process. Diagrams of the retort and sulfur measuring apparatus are also included.

PB 34005. EDWARDS, W. A. M. and others. I. G. Hoechst - Inorganic Division: Manufacture of sulphuric acid, sulphite products and chlorosulphonic acid. Sep 1945. (BIOS Final Rept 243, Item 22) May 1946. 37 p. Price: Microfilm - $1.00 - Photostat - $3.00

A flowsheet is given describing the contact sulfuric acid process at Hoechst. There are five new pyrites burning units producing 50 tons of SO_3 per day and a number of smaller units also burning pyrites. Particulars are given of the equipment, dimensions, materials of construction, working conditions, etc. Flowsheets and descriptions of the 100% SO_3 and Nebelsaure (chlorosulfonic acid-sulfur trioxide smoke mixture) plants are also given. Hoechst also produces several sulfite products using 7% SO_2 gas from the contact sulfuric acid plant and soda ash or caustic soda. Flowsheets are given for two of these, sodium pyrosulfite $Na_2S_2O_5$, and sodium sulfite crystals $Na_2SO_3.7H_2O$. Sodium bisulfite liquor, 40% $NaHSO_3$, is made both on the pyrosulfite plant and on an exit gas scrubbing plant on the old contact sulfuric acid units. The report also mentions a few other inorganic products of the Hoechst plant.

PB 34027. EDWARDS, W. A. M. and CLAYTON, J. H. I. G. Ludwigshafen: Sodium hydrosulfite and related compounds. Sep-Oct 1945. (BIOS Final Rept 422, Item 22) May 1946. 29 p. Price: Microfilm - $1.00 - Photostat - $2.00

The report describes the process for producing sodium hydrosulfite. Zinc dust slurried in water is circulated in a continuous reactor with liquid sulfur dioxide, and the zinc hydrosulfite solution is continually led off and passed through Scheibler filters. These liquors then enter a large vessel where they are decomposed with 25% caustic soda. The report describes the separation of the sodium hydrosulfite from the zinc oxide and the purification of the hydrosulfite. Drawings illustrate the process. Reaction times and materials of construction are given. The process has been made successfully continuous at the reaction and recovery stages, but due to clogging of the filters has not been made continuous at that stage. The report also describes the related compounds: Blankit I, Blankit II, Burmol, Rongalit C, Rongalit C. L., Rongalit C. W., and Dekrolin. Two alternative processes for making Rongalit (sodium sulfoxylate) and Dekrolin. Flow sheets illustrate these processes.

PB 27292. KEIES, F. G. and others. Stability and concentration of hydrogen peroxide. Final report. (OSRD Rept 5388) Aug 1945. 22 p. Price: Microfilm-$1.00 - Photostat-$2.00

The first part of the report describes the design and construction of a pilot unit to produce 5 lb./hr. of 80% H_2O_2 by rectification of 20% solution in a packed column. A sketch of the assembled unit is given in Fig. 1. An investigation was also made for the following purposes: (1) To study the rates of decomposition of hydrogen peroxide of concentrations varying from about 60% to about 90%, with and without the presence of stabilizers; (2) to observe the effect upon the stability of such solutions when in contact with various materials of construction such as might be used in a still for preparing H_2O_2; (3) to note the corrosive effect of such concentrated solutions of H_2O_2 upon these materials of construction. This is a final report under contract with Massachusetts Institute of Technology.

PB 34740. LOVELESS, A. H. The German phosphorus industry at Bitterfeld & Piesterits. (BIOS Final Rept 562, Item 22) Jul 1946. 75 p. Price: Microfilm-$2.00 - Photostat-$5.00

The report is based upon information obtained during the visit to the Russian Zone of Occupation from March 12 to April 3, 1946. The ground covered includes the manufacture of yellow phosphorus from phosphate rock; the conversion of yellow phosphorus to red phosphorus; manufacture of phosphorus sesquisulfide; manufacture of phosphorus chloride; manufacture of phosphoric acid by the combustion process. The information was chiefly obtained from the Russian technical officers in charge of the various plants, supplemented in certain cases by German reports and records. The factories concerned with the production of the above materials are I. G. Farben, Bitterfeld and Bayerische Stickstoffe A.G., Piesteritz. The appendices (in German) list the plant units used in the red phosphorus plant and the phosphorus chloride plant. Photographs, diagrams, and a few tables illustrate the report; a flow sheet for production of red phosphorus.

PB 27295. RODEBUSH, W. H. and others. Laboratory study of the possibilities of commercial synthesis of hydrogen peroxide by electrical and photochemical methods. Final report, Oct 31, 1945. (OSRD Rept 6644) Mar 1946. 134 p. Price: Microfilm-$3.00 - Photostat-$9.00
Two processes which produce hydrogen peroxide in high concentrations and except for the presence of water as a diluent, of a very high purity, from simple raw materials have been studied. One process uses the glow discharge and the other is a photochemical process. The starting materials are water or hydrogen and oxygen. In one method, the application of a high-voltage electrical discharge to water vapor produces 60% H_2O_2 by weight, the remaining 40% being water. A product containing about 80% H_2O_2 by weight is obtained when a gaseous mixture of hydrogen and oxygen illuminated with wave length 2537 Å is in the presence of a trace of mercury vapor. Both methods require, theoretically, about 3.6 KWH per pound. The laboratory scale preparation required 14 KWH per pound. The report discusses the merits of the two production methods. Bibliography. This is a final report under contract with the University of Illinois.

Ordnance Chemicals

PB 31199. BACHMANN, W. E. HMNA and related compounds. Final report, Sept 15, 1941 - Aug 15, 1942. (OSRD Rept 819) Aug 1942. 22 p. Price: Microfilm-$1.00 - Photostat-$2.00
A study has been made of the preparation of HMNA (ethylenedinitramine) by four different methods. HMNA was obtained from ethylenediamine in 87% overall yield from the diurethane and in 76% overall yield from the diacetyl derivative. The preparation of HMNA from ethylenediacetamide is of interest in view of the possibility of preparing this substance from compounds other than ethylenediamine. Cyclic ethyleneurea and certain polymers were converted to HMNA. The condensation of ethylenediamine with ethyl oxalate was studied in an attempt to prepare nitratable polymers. From one of the products HMNA was obtained. The analogs, propylenedinitramine and trimethylenedinitramine, have been prepared. The effect of other compounds on the melting point of HMNA is reported. The potassium and ammonium salts of HMNA have been prepared. The potassium salt detonates when heated. Preliminary work on condensations between HMNA and formaldehyde, and the potassium salt of HMNA and ethylenedibromide were carried out in order to obtain nitropolymers. Conditions have been worked out for nitrating glycoluril. The resulting nitroglycoluril (NGU) possesses unique burning properties. Dimethylglycoluril suffered extensive decomposition during nitration and a nitro compound was obtained in only poor yield. This is a progress report under contract with the University of Michigan.

PB 31100. BACHMANN, W. E. The preparation of explosives from ethylenediamine. Final report, Sep 15, 1941. (OSRD Rept 152) Oct 1941. 29 p. Price: Microfilm-$1.00 - Photostat-$2.00
Ethylenedinitramine (EDNA) has been prepared from cyclic ethyleneamonourea, especially through ethylenediurethane. The preparation and nitration of ethylenediurea is also described. This last did not yield any ethylenedinitramine. Preliminary work has also been done on the preparation of propylenedinitramine, cyclopropanetrinitramine, nitroaminoacetic acid, and nitroaminoacetmethylnitramide. Bibliography. This is a final report under contract with the University of Michigan.

PB 34799. BARTLETT, PAUL D. Reaction of HS (mustard) with thiourea, sodium ethylxanthate and disodium ethylene dimercaptide. Progress report, Jun 10, 1942. (OSRD Rept 836) Aug 1942. 5 p. Price: Microfilm - $1.00 - Photostat - $1.00
The preparation of three derivatives of HS (Levenstein mustard) is described. These derivatives are (1) a crystalline solid from thiourea, (2) an amorphous solid from the disodium salt of ethanedithiol, (EDT) or disodium ethylene dimercaptide and (3) an oil from sodium ethylxanthate. Physiological tests show that the two solid products are without the vesicant action characteristic of HS, while the liquid product is vesicant. A bibliography is included. This progress report covers work under contract with Harvard University.

PB 31086. DAVIS, TENNEY L. Preparation of polynitronaphthalenes. Final report (and addendum). (OSRD Rept 115) Jun 1941. 109 p. Price: Microfilm-$3.00 - Photostat-$8.00
Research was directed toward the development of a practical method of synthesis of tetranitronaphthalenes. This work was divided into two parts; one, the preparation of pure di and tri nitronaphthalenes to be used as starting materials for the synthesis, and two, the study of the nitration of these pure isomers. As a result of the first part of the work the following pure di and trinitro compounds were prepared:

1 nitronaphthalene	m.p.	55-56°
1,5 dinitronaphthalene	m.p.	209-213°
1,8 dinitronaphthalene	m.p.	167-169°
1,4,5 trinitronaphthalene	m.p.	147-149°
1,3,8 trinitronaphthalene	m.p.	212-215°

During the course of the second part of the work, methods of preparation of tetranitro compounds were devised, for which the compounds mentioned above were the starting materials. In all cases, the synthesis may be carried out as a one-step process under mild nitrating conditions (in the presence of H_2SO_4 (d 1.84) at a reaction temperature of 80°). Unfortunately, the process suffers two disadvantages; one, the maximum obtainable yield of tetranitronaphthalenes is 50%, and two, an excess of 2-3 mols of nitric acid must be employed. The following pure tetranitro isomers have been prepared:

1,3,5,8 tetranitronaphthalene	m.p.	191-193°
1,3,6,8 tetranitronaphthalene	m.p.	201-203°
1,4,5,8 tetranitronaphthalene	m.p.	does not melt, decomposes beyond 300°.

PB 31073. DYNAMIT A.G., DUISBERG, GERMANY. Warm storage of powder. 1940-1945. (BIOS Halstead Exploiting Centre Rept 5118) May 1946. 116 p. Price: Microfilm-$3.00 - Photostat-$8.00

This report is a translation of a German document. The warm storage tests carried out at Duneberg were based on the assumption that any alteration to the powder represents a chemical reaction, the duration of which depends on the storing temperature in accordance with van't Hoff's law. This method assumes that an increase of 10° in temperature shortens the period of the reaction by from one-third to one-half. As the standard temperature for Army and Luftwaffe powder is plus 10° and for Navy powder plus 15°, warm storage over a period of six months at 35° and 40°, according to a German report, corresponds to a normal storing test of five years. The warm storages undertaken at Duneberg were carried out partly by the three forces concerned and partly by the firm. The results of the tests are presented in tables and graphs. Compositions of each powder are given.

PB 31094. ELDERFIELD, ROBERT C. Explosives from hydroxy and amino compounds. Progress report, Sep 15, 1941. (OSRD Rept 158) Oct 1941. 42 p. Price: Microfilm-$1.00 - Photostat-$3.00

A number of commercially available amino-alcohols have been condensed with 2,4-dinitrochlorobenzene and the products have been nitrated further to yield explosives of the general type trinitrophenylnitramines. Products from nitration of several glycerol derivatives, guanidine derivatives, phenylbenzotriazole derivatives and of a special "fibrous starch" were studied. Of the explosives produced heptryl, ditetryl and trinitrophenylisobutylolnitramine nitrate seem especially worthy of further study. Preliminary stability tests, tables, phase diagrams and bibliography are included. Some pages of the report will not reproduce well. This progress report covers work under contract with Columbia University. For subsequent OSRD rept 907, see PB 31085.

PB 31085. ELDERFIELD, R. C. Explosives from hydroxy and amino compounds. Progress report. (OSRD Rept 907) Sep 1942. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00

This report represents the results obtained in an investigation of explosives derived from hydroxy and amino compounds(described in OSRD rept 158, PB 31094). The work can be divided into five headings, namely, (1) extension of the investigation of the preparation of analogs of tetryl derived from hydroxy-amino compounds and preparation of certain derivatives of hydroxy compounds; (2) the preparation of lots of several hundred grams of various intermediates for the use of the Bruceton laboratories; (3) a continued exploration of the preparation of various guanidine derivatives and their nitration products; (4) investigation of the preparation of certain nitroamines; (5) miscellaneous. The use of purified DNCB (dinitrochlorobenzene) for the preparation of tetryl analogs has been found to be of importance, and a convenient method for purification of this substance is outlined. The yields of new condensation products derived from DNCB and various hydroxy amines have been improved in many cases. The nitration of such condensation products has also been improved by use of a more dilute nitrating acid such as is recommended by British practice in the manufacture of tetryl. Ethylene glycol has been condensed with both one and two moles of DNCB and the resulting condensation products have been further nitrated to yield explosive substances. Details for the preparation of trinitrophenylnitroguanidine have been worked out. The preparation of N-(β-hydroxyethyl)-N'-nitroguanidine nitrate has been worked out. Unsuccessful attempts at the preparation of di- and tetra- substituted hydroxyethylguanidine from mono-ethanolamine and di-ethanolamine have been made. Trishydroxymethylmethylguanidine has been prepared, but nitration of this has not led to a well defined substance. The preparation of N,N'-dinitropiperazine has been worked out. The rate of hydrolysis of NENO (N,N'-dinitro-N,N'-diethanoloxamide dinitrate), both at room temperature and at 65° when suspended in water has been studied. This is a progress report under contract with Columbia University.

PB 31091. FIESER, LOUIS F. Aromatic-aliphatic nitro compounds and nitrate esters. Final report, Sep 15, 1941. (OSRD Rept 176) Nov 1941. 44 p. Price: Microfilm-$1.00 - Photostat-$3.00

Examples of aromatic-aliphatic compounds containing three or more nitro or nitrate ester groups were synthesized. Some were found to be too unstable for use as explosives while others were yet to be tested. The methods of synthesis used are not readily adaptable to large scale production. The document consists mainly of three parts: (1) The condensation of nitrobenzaldehydes with nitromethane; (2) the condensation of nitrophenylmethanes with formaldehyde; and (3) the Ponzio reaction; 2,4,6 trinitrobenzyl nitrate. This is a final report under contract with Harvard University.

PB 31098. HURD, C. D. Preparation of tetranitromethane. Progress report. (OSRD Rept 334) Jan 1942. 9 p. Price: Microfilm - $1.00 - Photostat - $1.00

The preparation of tetranitromethane from acetylene and nitric acid, from acetic anhydride and nitrogen pentoxide, and from acetic anhydride and nitric acid was investigated. The last was the most satisfactory, giving yields of 60-66%. The action of nitric acid on six compounds containing the CH_3CO- group and on ketone yielded no tetranitromethane. Bibliography. This is a progress report under contract with Northwestern University.

PB 27240. REES, THOMAS and others. Japanese gas detector kit A. (CWS 45th Chemical Lab Co. Captured Materiel Tech Rept 53) Mar 1945. 10 p. Price: Microfilm - $1.00 - Photostat - $1.00

The contents of this kit were found on testing to consist of liquid A (carbon tetrachloride, iodine and sodium iodide), liquid B (ethyl mercaptan) and liquid C (iodic acid in water); testing papers being black rectangular paper pads having a strong odor of iodine; funnels made of waxed paper; and cotton pluge. These detectors were tested with mustard and lewisite, and the results are tabulated in the report. This kit is for the detection of mustard and lewisite in water and solids, but the tests provided in the kit are not specific for mustard and lewisite. Therefore, the presence of agents is indicated but not definitely proved. The kit can prove the absence of the agents and indicate the possible presence of the agents. Photograph is included.

PB 34750. WOLFROM, M. L. Preparation of pentaerythritol. Final report, Aug 13, 1941. (OSRD Rept 148) Oct 1941. 28 p. Price: Microfilm-$1.00 - Photostat-$2.00

A recommended procedure for the preparation of pentaerythritol (PE) by the condensation of formaldehyde and acetaldehyde in the presence of calcium hydroxide is described. A study was made of the reaction, including the effect of small amounts of possible promotors for the condensation. The results are tabulated. Bibliography. This is a final report under contract with Ohio State University.

Analytical Chemistry

PB 19374. CORRENS. Kursbericht über die untersuchungen der bergfeuchtigkeit (Studies of the moisture in rocks.) (ALSOS Mission, RFR 506 34) Dec 1944. 1 p. Price: Microfilm - 50¢ - Photostat - $1.00
This is a short report of undetermined origin, on the analyses of soluble salts contained in mineral samples from seven drillings through different geological horizons. The composition of the various aqueous solutions differed considerably. There was also found to exist a difference in the solubility in hot and cold water which was characteristic for each sample.

Chemical Engineering and Equipment

PB 34743. LOVELESS, A. H. Distillation of phenols at I.G. Farben Fabrik, Wolfen. Mar-Apr 1946. (BIOS Final Rept 560, Item 22, 30). Jun 1946. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
The phenol distillation plant at Wolfen consists of three batch distillation units. The starting material is phenol oil from Leuna which comes in three grades, SRI-51, RD-51 and MD-51. The SRI-51 is previously purified at Leuna by treatment with sulfuric acid. In the distillation process, the phenol oil is sucked into the still kettle by vacuum and heated and distilled by means of steam. The distillate is cut into various fractions characterized by particular ranges of freezing point or by specific gravity. The report lists the fractions taken in the case of both SRI-51 and MD-51. The analysis and process control of the distillation and the method of examination of crude cresol are described. A brief description of the process units are also included. This Wolfen plant is manually controlled but continuous operation was planned.

PB 27237. MAKEPEACE, EDWIN H., JR. and others. Japanese oxygen generator. (CWS 45th Chemical Lab Co. Captured Material Tech Rept 58) Apr 1945. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
An investigation was made of a captured Japanese oxygen generator. The main mixture when analysed was found to contain KCl - 1.67%, $KClO_3$ - 71.5%, iron (free) - 5.0%, iron oxide - 15.5%, SiO_2 - 0.9%, moisture - 1.64%, asbestos - 3.65%. The generator was incomplete and therefore no functional tests could be made. However, it is believed that a match is applied to the wick, which in turn burns the igniter mixture, which burns through to the main oxygen producing mixture. This oxygen generator was used by personnel for high altitude flying. A photograph of the generator is included.

Miscellaneous Chemicals

PB 18800. AMMONIAKWERK MERSEBURG. Suggestions for improvement of manufacturing processes. (MIS VII 68a 7008997) n. d. 37 p. Price: Microfilm-50¢ - Photostat-$3.00
This report contains a number of suggested improvements in technic and apparatus submitted by the Leuna plant of Ammoniakwerk Merseburg. These include: (1) use of a strip of gummed paper in place of lead seals for cylinders and other containers for liquified gases; (2) a device for removing foreign objects that have fallen into tank cars; (3) an improved method of determining the absolute vapor pressure of i. and n-butane and pentane, (drawing included); (4) an automatic recording device for Stock's analysis; and (5) testing apparatus for leaks in valves of pressure bottles used for shipping gases. In German.

PB 31278. BAIRD, W. Textile auxiliary products: Development of Mersol and Hostapon processes by I.G. Farbenindustrie, Höchst. Oct 1945. (BIOS Final Rept 478, Item 22) Jun 1946. 59 p. Price: Microfilm-$2.00 - Photostat-$4.00
I. G. Farbenindustrie manufactured large quantities of Mersol type products during the war using the well known Reed reaction which comprises making sulfochlorides by reacting a paraffin with a mixture of chlorine and sulphur dioxide under the influence of light. I. G. used a hydrogenated Fischer-Tropsch oil fraction, Mepasin, as their paraffin and the two main products were (a) Mersol D in which the major portion of the paraffin is reacted and the product contains appreciable quantities of disulfochlorides and chain chlorinated derivatives and (b) Mersol H in which only about half the paraffin is reacted and in which disulfochlorides and chain chlorination are greatly reduced. Although manufacture of these products was carried out at Leuna and Wolfen most of the original development work was done at Höchst and the latest work there related to the devising of a continuous reaction for the Mersol H. A copy of the report describing the work was obtained and a translation is given in this report. Another reaction was used as an alternative to the Reed process. This comprises reaction of the paraffin with sulphur dioxide and oxygen whereby the sulfonic acid is produced direct. Light or acetic anhydride is used to catalyze the reaction. Copies of the two most recent reports on this subject were obtained and translations are given in this report. The sulphur dioxide-oxygen product is known as Hostapon acid and the sodium salt as Hostapon. The products were considered to be essentially the same, chemically, as the hydrolyzed Reed reaction products and their technical performance as detergents, was the same. A pilot plant for the light-catalyzed procedure had been erected at Höchst but that for the acetic anhydride method (a continuous process) had been erected at Leuna. It was the opinion of I.G. personnel that the acetic anhydride catalyzed Hostapon process had technical and economic advantages over the Mersol process. This was because of savings in power cost and elimination of the hydrolysis stage necessary for the Reed sulfochlorides and because the plant would be easier to construct and to maintain. Soap manufacturers wished to have the free Hostapon acid and not the sodium salt in order to fit in better to their manufactures and this necessitates the additional complications involved in isolating the free acid as distinct from the sodium salt. Where the sulfochloride is required as an intermediate for other reactions, e.g. conversion to the sulfonamide to make Mulphor STH, the Reed reaction would of course be preferable. In addition to the known uses for the Mersols, it was considered that a hydrolyzed Mersol H type still containing the unreacted oil would have definite commercial possibilities as an agent for cleansing oily hands, e.g. by mechanics. The Mersolats or Hostapon types were not considered good detergents, their main feature being their independence of natural fats. The cracking of Fischer-Tropsch waxes and sulfonation of the resulting olefines did not appear to be economically sound.

PB 34004. BAIRD, W. Textile auxiliary products manufactured by I.G. Farbenindustrie, Mainkur Works. (BIOS Final Rept 239, Item 22) Mar 1946. 13 p. Price: Microfilm - $1.00 - Photostat - $1.00

Some of the textile auxiliary products manufactured at the Mainkur Works of the I. G. appeared of outstanding interest. These include: Humectol CK, a wetting, etc., agent; some of the Katanol series, resists and mordants; Solidogens, dyefixing agents; and a few other miscellaneous products. De-emulsifying agents of the Dismulgan class were also produced at this factory and oleyl alcohol, a textile auxiliary intermediate was made as a war-time emergency. Data on the manufacturing processes have been provided. Some data on research topics has been given in the Appendix. Also considered were Appretan D, Veltron C, Glycinal D, Kaurit MKF, Leophen KN, and Peregal KB.

PB 34025. BAIRD, W. Textile auxiliary products of Chemische Fabrik Pfersee G.m.b.H., Augsburg. Oct 1945. (BIOS Final Rept 420, Item 22) May 1946. 6 p. Price: Microfilm - $1.00 - Photostat - $1.00
A brief account is given of the Imprägnol and Hydrophobal wax emulsion water-repellents and other auxiliary products manufactured by this firm. The other products mentioned are Aviva, Ceropon, Gumminat, Oleonat, Rabic, Terkyd, Textal, Volumin, Thianol, the Proserpins, Adhäsin, Simpra, and Kunstseidenschlichte PF.

PB 34007. BAIRD, W. Textile auxiliary products of I. G. Farbenindustrie, Leverkusen. Oct 1945. (BIOS Final Rept 259, Item 22) Apr 1946. 12 p. Price: Microfilm - $1.00 - Photostat - $2.00
Process data has been provided on the manufacture of the Blankophors, the Eulans, various Katanols, Soromins, and other textile auxiliary products made by I. G. Leverkusen. An indication has been given of the use of these products. Notes on the dyeing of synthetic resins and related materials, on the Preventols and on Dermolan L neutral (an agent to prevent skin irritations) have been included in this report. Also considered in the report were Amylose, Appretans, Celloxan liquid, Ortoxins, Persistolgrund B and Tanigan LLB.

PB 34028. EDWARDS, W. A. M. and CLAYTON, J. H. Deutsche Gold und Silber Scheide Anstalt (Degussa), Frankfurt: Report on organization, research activities & production of sodium cyanide, sodamide & potassium ethyl xanthate. (BIOS Final Rept 423, Item 22) Sep-Oct 1945. 51 p. Price: Microfilm-$2.00 - Photostat-$4.00
The organization of this company and the scope of its activities is described in this report. More or less detailed information is given regarding several important chemical processes. The company makes 98% sodium cyanide by the Castner process from charcoal, sodium and ammonia. This is a batch process but a continuous process (pilot plant size) is described for making either hydrocyanic acid or sodium cyanide. The newer process uses nitrogen gas and tablet mixtures of sodium carbonate, charcoal and ferrous carbonate. The cyanide formed is converted to hydrocyanic acid by charging the melt with CO_2 gas and steam. 100% sodium cyanide is formed by leading the hydrocyanic acid into caustic soda. Brief particulars of the composition and uses of "Durferrit" heat treatment salts were obtained. These salts, based on cyanides, chlorides, nitrates, etc., were used for carbonising, hardening or nitriding of steel. The process for making sodamide from molten sodium and ammonia gas is also described. Production of potassium ethyl xanthate is based on the reaction between ethyl alcohol, caustic potash and 400% excess of ethyl alcohol. Mention is also made of various other products manufactured by this company, such as precious and rare metals, ceramic colors and chemicals. More detailed information is given regarding production of substitutes for carbon black (silicon dioxide K_2) and metal powders. The subjects of the company's research is also indicated.

PB 20863. RICHRIE, HEINZ. Aufzeichnungen über gründung, entwicklung, organisation und mitglieder von TEA - Hauptgruppe 2- Kommissionen der I.G. Farbenindustrie A.G. (Notes on foundation, development, organization and membership of the commissions of the TEA (Technical Committee) of the I.G. Farbenindustrie, A.G., comprising main group 2). (Alphabetical list of abbreviations used in connection with I.G. Farbenindustrie commissions.).
An extensive exchange of experiences and ideas on scientific, technical and economical problems was customary among the various plants and installations of the I.G. Farben, A.G. This practice originated with the various chemical concerns prior to their incorporation into the I.G. holding company; in later years committees or commissions for certain specific fields were constituted and meetings were held at periodic intervals. This document describes the history and activity of the commissions which were subordinated to the main group 2 of the TEA, the technical committee of the I.G. concern. The Inorganic Commissions (ANEO, ANWIKO) were established in 1926 and meetings were held every three months at the locations of the different plants represented. Manufacturing, cost, development and future planning in the field of inorganic chemistry were covered in collaboration with the Scientific Inorganic Commission (ANWIKO) and the chemicals commission. The sulfur sub-commission (sulfur-UKO) originated in 1931; it was concerned with sulfuric acid, sodium sulfide and sulfur questions. The chromium sub-commission (Chrom-UKO) originated in 1921 and was formally constituted in 1924. The origin of the chlorine sub-commission (chlor-UKO), dates back to October 1920; formal constitution of this committee of six took place in 1927. The Chlor-FAKO, an enlarged group of about 30-40 chlorine experts, met periodically at different plants. Foundation of the metals sub-commission on (Metall-UKO) was first contemplated in 1932. It dealt with scientific, technical and economic questions pertaining to metals and their compounds, with the exception of the light metals. The procurement and stock-piling of ore was included in its scope at a later date. Compilation of an index of inorganic compounds produced by the I.G. Farben and affiliates was undertaken in 1938. Common problems of acid manufacture of the Dynamit A.G. and the I.G. Farben were covered by a liason commission (DAG-I.G. Fachkommission Säure), established in Nov 1942. Zetko was concerned with inter-plant exchange and utilization of intermediate products, assisted by the WIZETAO (scientific intermediates commission), and a group (N-AS-K) on naphthol-AS-products. Cooperation between plant and laboratory was a frequent topic of discussion of the analytical commission (ANAKO). A committee of four chemists undertook the preparation of a catalogue of the organic compounds produced by the I.G. This work was begun in 1927 and brought up to date at periodic intervals. The azo-dye commission (AKO) was organized in 1926. It supervised the great expansion of manufacturing facilities in this field; the war years brought discussions of the dye marketing and manufacturing conditions in occupied territories. The work was integrated with that of the scientific azo commission (Wiss. AKO). Other groups dealing with dyes were: The KOMMISSION 9 (alizarin and vat dyes), the TRIKO (triphenyl methane dyes), the INDIGO group, the SCHWEKO (sulphur dyes) and scientific SCHWEKO. The solicort commission (LOKO) collaborated closely with plastics and lacquer groups. Aspects of the sugar synthesis, plastics industry, and acetylene production were discussed. In later years the problems pertaining to plastics and synthetic rubber were turned over to the KUKO (scientific commission for plastics), the commission K (manufacture of plastics and synthetic rubber), the KUTEKO (application of plastics), the

KAUTEKO (application of synthetic rubber) and the scientific rubber commission. In this connection, an interesting and rather detailed summary of the discussions leading to the establishment of two synthetic rubber plants (Buna) is presented. The strategic importance of a natural rubber substitute was realized as far back as 1934, and lengthy negotiations were carried on between the I.G., the rubber and tire industries, the army, and the various German ministries and offices concerned. The color commission (CK) was constituted in 1925. Its scope included standardisation of dyes, dying problems pertaining to textile, paper and others. Textile production aids were dealt with by the THK, founded in 1930. Soap substitutes were developed. The first of the semi-annual meetings of the lacquer commission (LARO) took place in 1926. Coordination of commercial and scientific endeavor in the lacquer field was undertaken. The group WARO handled development and sales of raw materials for the soap industry. Tanning agents were discussed by a group of experts concerned, at meetings during the years 1935 to 1943. The pharmaceutical commission, with its subdivision, held a total of 82 meetings, and appears to be one of the most active of the groups. The technical commission (TEKO) is divided into the EKO (electricity), WÄKO (heat), BAUKO (buildings), LAKO (storage) and NORKO (standardization). A building material commission dealt with the production and merchandising of road, and building materials and related products, such as camouflage material, glass substitutes and floor coverings. The exchange of patent information among the various chemical concerns, dates back to 1919. Consolidation of a patent commission occurred about 1927. Domestic and international questions of patents and patent laws comprised the field of this group. The SOKO (social welfare commission) dealt with wages, union matters, health and safety affairs and pensions. The year 1933 brought a dissolution of this group and a reorientation in all social matters along new lines. The F.A. (Farben Ausschuss or Dye-Committee) was constituted in 1925, and enlarged in 1927. It met rather frequently and collaborated closely with the CK and merchandising groups. The history of the new administrative building in Frankfurt A/M is presented. The commercial committee (Kaufmannischer Ausschuss) was reactivated in Berlin in 1937, to coordinate the merchandising activities of the various branches. Economical problems and incorporation of occupied territories into the marketing organisations of the I.G. were discussed. The second part of this document is devoted to approximately 200 biographical sketches of the key personnel of the I.G., and statistical data on employment, and military service of chemists.

PB 34002. ELLIS, W. J. and GREENFORD, G. R. Production of citric acid at the factory of Joh A. Benkiser, Ladenburg, near Heidelberg. Dec 1945. (BIOS Final Rept 220, Item 22) May 1946. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00

The production of citric acid is described. In the process, molasses (a by-product of the sugar-beet industry) is adjusted to standard sugar content and then sterilized by boiling. On cooling the liquor is run into sterile trays kept in sterile constant temperature - Humidity rooms. Here the molasses solution is inoculated with Aspergillus niger XIII spores and growth allowed to proceed for 10-11 days. At the end of this time, the liquor is pumped to large tanks and the citric acid precipitated by the addition of lime. The resultant calcium citrate is transferred to another plant for treatment with sulfuric acid to yield citric acid. It is claimed that this process produces citric acid free from oxalic acid. The yield from molasses is said to be 35% and from sugar 70%. Diagrams of the filter beds and fermentation room are included, together with two photographs.

PB 23276. KLEBER, JOSEF. Beitrag zur kenntnis der bildung von acetylmethylcarbinol u. 2,3-butylenglykol bei der garung (Contribution to the knowledge of formation of acetyl methyl carbinol and 2,3-butylene glycol during fermentation). 1939. 51 p. Price: Microfilm-$1.00 - Photostat-$4.00

In this doctorate dissertation, the author reviews the work and literature pertaining to various by-products of fermentation. He develops a modification of existing methods for the determination of acetyl methyl carbinol and 2,3-butylene glycol with Ni-dimethylglyoxime, and a method for determining small quantities of diacetyl with the stepphotometer, using a solution of Ni-dimethylglyoxime in pyridine. He describes laboratory and large scale experiments conducted with various types of yeasts, grape, fruit, and berry wines and arrives at the conclusion that the amount of acetyl methyl carbinol and 2,3-butylene carbinol formed during fermentation is influenced by fermentation methods and conditions. A direct connection between the amount of alcohol formed and the two by-products in question has not been proven. An evaluation of the products of vinegar - fermentation proves a definite relationship between the amounts of citric acid and of acetyl methylene carbinol, the latter being a product of citric acid reduction. Drawings and tables.

PB 19600. LÜTTRINGHAUS, ARTHUR and SUCKER, ELVRIEDE. Reibung und schmierung (Friction and lubrication) Reichsforschungerat (ALSOS Mission, HFR 505 12) Nov 1944. 14 p. Price: Microfilm - 50¢ - Photostat - $1.00

This detailed report deals with the development of a method for the preparation of Δ -1-olefins and the preparation of certain examples of these olefins to be used in a separate project on friction and lubrication. Pure Δ-1-olefins were prepared by Grignard's reaction. The special olefins prepared were isomeric olefins with 8 C-atoms (n-octenes 1,2 and 4, and 2-methyl-heptene-2) and cyclic olefins of the cyclohexane series (1-methyl-cyclohexene, cyclohexyl-ethylene, and allyl-cyclohexane). In German.

PB 34033. PERDUE, G. R. Enzyme products and 'Acrisin' finishing agents for textiles: Rohm und Haas, G.m.b.H., Darmstadt. Sep 1945. (BIOS Final Rept 436, Item 22) May 1946. 21 p. Price: Microfilm-$1.00 - Photostat-$2.00

'Concentrated preparations of pancreatic tryptase and diastase were prepared from an aqueous extract by selective precipitation. The concentrated products were diluted with sodium carbonate or sodium chloride respectively before being sold. The Acrisins were formaldehyde-acrolein-urea condensation products and were used to produce non-swell and non-shrink finishes on viscose rayon. The condensation was a very simple process carried out in acid solution and the products were neutralised before sale. In use, an acidified solution was padded on to the fabric which was dried at a high temperature. The more important products were stable indefinitely in store. Crease resistant finishes were originally claimed for certain of the products but it did not appear that this had been very successful.' The appendix describes the manufacture of the Acrisins and also contains a translation of an advertising booklet regarding the Acrisins.

PB 19389. SPENGLER, GÜNTER. Synthese von reinen kohlenwasserstoffen (Synthesis of pure hydrocarbons). Reichsforschungerat. (ALSOS Mission, HFR 506 16) Jan 1945. 1 p. Price: Microfilm-50¢ - Photostat-$1.00

This is an enumeration of the olefins synthesized by the author according to the method of Board and Tiffeneau. They were: 1- tridecene, 1- pentadecene, 3- pentadecene, 8- pentadecene, 3- methyl- 1- tetradecene, 1-nonadecene and 1-heneicosene. In German. No further information is given.

PB 19387. THILO, ERICH. Eisenkontakt (Iron catalysts). Reichsforschungsrat. (ALSOS Mission, EFR 506 18) Dec 1944. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
For his experiments with iron catalysts, the author prepared twenty different catalysts, falling into four main groups: (1) $Fe(OH)_3$ with varying amounts of $Al(OH)_3$; (2) $Fe(OH)_3$ precipitates with varying amounts of kieselguhr; (3) ferrosulfate precipitate with water glass, plus varying amounts of kieselguhr; and (4) ferrous sulfate precipitate with $Al(OH)_3$, $Mg(OH)_2$ and $CaCO_3$. Two standard catalysts were also prepared. A brief outline of the experiments conducted, and the reasons for interruptions, make up this brief progress report. In German.

PB 31087. WILLIAMS, J. W. Mechanism of gelatinization and solution of fibrous nitrocellulose in non-aqueous solvents. Progress report. (OSRD Rept 898) Sep 1942. 21 p. Price: Microfilm-$1.00 - Photostat-$2.00
Measurements of the swelling and solubility behavior of nitrocellulose in several solvents and at several temperatures have been made. Commercial methanol exerts considerably more swelling and solvent action on guncotton (13.36% N) than does 95% alcohol, both alone and in other mixtures. At dry ice temperature methanol appears to dissolve the nitrocellulose, but 95% alcohol does not. The influence of a number of additives on the gelatinization of guncotton in 2:1 ether-alcohol was measured quantitatively by means of swelling coefficients. Dibutyl tartrate and methyl acetamide were the most satisfactory chemicals of the group tried. The solubility of guncotton in the ternary solvent, ether-95% alcohol-acetone, was determined at 25-27°C. and at 2-3°C., using one gram of nitrocellulose and 200 cc. of solvent. The concentration of acetone necessary to completely dissolve guncotton in 2:1 ether-alcohol appears to be considerably greater than the concentration required to maintain homogeneity in this system once the guncotton is dissolved by an excess of acetone. Some remarks are made regarding a possible explanation of this apparent discrepancy. Much less acetone is required to dissolve guncotton in ether than in 95% alcohol. The minimum acetone concentration for complete solution is in a mixture of 2:1 or 3:1 ether-alcohol at room temperature. At 2-3°C. this minimum concentration occurs in mixtures still richer in ether. At the lower temperature solubility is considerably increased except in the cases of the binary mixtures ether-alcohol and acetone-alcohol. Swelling and solubility correlate nicely as the acetone concentration is changed. However, when the temperature is lowered, swelling increases more rapidly than does solubility. The solubility and swelling coefficient data show that the composition of the present commercial dispersing medium, 2:1 ether-alcohol could be improved upon in ways which seem to be practical. Graphs. This is a progress report under contract with the University of Wisconsin.

PB 31201. WOLFROM, M. L. The preparation of sugar alcohols and glycosides for nitration studies. Final report, Sep 15, 1941. (OSRD Rept 147) Oct 1941. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report describes the preparation and purification of a number of sugar alcohols preparatory to nitration. Five to ten gram quantities were prepared for combustion studies and two hundred gram quantities of each were made up for nitration tests. The samples made for combustion studies included dulcitol, erythritol, l-fucitol, lactitol dihydrate, d-mannitol, α-methyl-d-glucopy-ranoside, β-methyl-d-glucopy-ranoside, l-rhamnitol and d-sorbitol. The samples made for nitration included erythritol, d-mannitol, α-methyl-d-glucopyranoside, d-sorbitol, dulcitol, lactitol dihydrate and xylitol. This is a progress report under contract with the Ohio State University.

DETERIORATION STUDIES (INCLUDING TROPICAL DETERIORATION)

PB 34752. SHANOR, LELAND and others. Fungus-proofing of textiles and cordage for use in tropical service. (OSRD Rept 4613) Jan 1948. 60 p. Price: Microfilm-$3.00 - Photostat-$4.00
This report was prepared for the Tropical Deterioration Administrative Committee by the Sub-Committee on Textiles and Cordage. It is limited in its scope to tropic-proofing against deterioration caused by microorganisms, especially fungi. The report consists largely of unpublished findings of the various Services and other Government laboratories which have been engaged in this study. The fungus-proofing agents considered include copper, zinc, mercury, and phenolic compounds. The materials include equipage fabrics, cordage and thread, personal equipment and clothing, all of cellulose origin, and also coated fabrics, rayons, wool, silk and synthetic resin fibers. Appendix A lists the manufacturers of fungus-proofing agents on textiles and cordage and Appendix B lists the Service and other Government laboratories active in this program. Extensive bibliography; index.

PB 36759. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, IND. Examination of athletic goods and equipment after storage under tropical conditions. (Rept 164) Jun 1945. 33 p. Price: Microfilm - $1.00 - Photostat - $3.00
Three boxes containing various athletic and recreational items were examined to determine the effect of storage under tropical conditions. Exposure, under varying tropical conditions, was continued for five months. The contents of each box are listed, and observations thereon presented. It is concluded that: (1) in general, the packaging and packing was poor as measured by QMC standards; (2) items fabricated from wood, or both paper and wood, should be packaged so as to afford adequate protection against moisture and mildew; (3) the enamel finish used on the metal portions of the various items did not adequately protect against corrosion; (4) plywood to be used or stored under humid conditions should be bonded with a waterproof adhesive. Photographs are included, but some of them will not reproduce well.

PB 36753. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, INDIANA. Textile finish, resistant to degradation by microorganisms and tropical exposure: Q.M.C. project 880 - 42. A progress report on comparison of fungicides in resin coated fabrics. (Rept 182) Jun 1945. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00

Fabrics coated with pyroxylin or vinyl resins, without the addition of a fungicidal agent, have been found to sustain mold growth which destroys both the appearance and serviceability of the fabricated item. Although certain plasticisers used in these resinous coatings exhibit a resistance to fungus growth, it was felt that the addition of a stable preparation of known fungicidal action was highly desirable. Preliminary work has shown that coated fabrics, not containing an added fungicide, are damaged in soil burial, and show extensive mold growth in enriched soil suspension tests. These tests were used to compare a number of coated fabrics containing various commercial fungicides, the results of which are presented in this report. Copper 8-hydroxy quinoline appears to be the only satisfactory fungicide, of those tried, in vinyl coatings. Table is included.

ELECTRICAL MACHINERY, EQUIPMENT, AND SUPPLIES

Communication Equipment

PB 32571. COOP, E. and others. German wireless communication, mainly with reference to cm, dm and pulse technique. (BIOS Final Rept 551, Item 7) n. d. 19 p. Price: Microfilm-$1.00 - Photostat-$2.00
The 19 targets visited yielded little information additional to that already known. This report (written Mar 1946) therefore, only covers certain specific points on which full details have not yet been published. Doctors Marx, Kroebel and Rosenstein and Dipl. Ing. Richard Pilipowsky and Dipl. Ing. Alfred Vollmeyer were interrogated on production and utilization of short pulses. Vollmeyer had been working on a multi-channel speech secrecy system. Herr Protze of Telefunken described briefly work on a high stability circuits employing ceramics, Dr. Von Trantini worked on search receivers for centimeter wavelengths and broad-band matching devices, Dr. Seidelbech the facsimile system, and Dr. Ludwig Meyer worked on klystrons and magnetrons. Conclusions are that the Germans had no centimeter or multi-channel pulse-modulated wireless communication equipment in operation and no outstandingly new systems were envisaged. Most wireless communication equipment has now been removed or destroyed and the German technicians have forgotten many of the detailed points of design. Circuit diagram of high-stability oscillator and other sketches illustrate the report.

PB 28729. JAFFE, B. F. and others. Report on C. Lorenz A.G. (CIOS File XXV-12, Item 1) May 1945. 14 p. Price: Microfilm-$1.00 - Photostat-$1.00
An investigation was made of the production and development of radio, radar and other items manufactured by C. Lorenz A.G. Locations of the various plants, plant organization, and the financial statement of the firm are included in the report. Some general information relative to their production is reported here.

Electronics

PB 20628. BÄRNER, KARL. Elektrische höhenmessung durch lotung, landefühler. (Radio altimetry through sounding, "landing feeler") (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik V C 6) Jun 1939. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This document "Ringbuch der Luftfahrttechnik" discusses the disadvantages of the barometric altimetry and presents also proposals to measure the altitude of aircraft by high frequency procedures. Those methods which are given a closer consideration were studied in regard to their effect, measurement exactness, error sources and efficiency limits. As yet, no apparatus has been developed which could offer complete satisfaction. Various procedures are discussed in this study, which have not yet been completed. The purpose of that presentation was to give a general outlook of the present state in regard to radio altimetry. Photograph, diagrams and a bibliography of 22 items are included.

PB 28837. BARNES, C. B. AN/APS-4 aircraft radar. n. d. 22 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report is made by the Airborne Radio Division of the Naval Research Laboratory. The AN/APS-4 is a light weight microwave radar system intended primarily for use by the U. S. Navy's carrier based planes. Prior to the AN/APS-4 there had been both light weight and microwave radars for aircraft use but no combination of these two desirable features. The system operates on the X band frequency of 9375 megacycles and weighs approximately 175 pounds. This set combines simplicity and dependability of operation; ranges such as the following have been reported: land at ninety miles (nautical) from high altitudes and at fifty miles from an altitude of five hundred feet; aircraft carriers at forty-five miles and single planes at eleven miles. It is primarily a search type aircraft radar designed to operate satisfactorily over a wide range of atmospheric conditions, ranging from -30° to+50° C. and at relative humidities of 95%. Satisfactory operation is also obtained at altitudes up to 30,000 feet above sea level. The construction of the set is shown in photographs as well as its installation on two types of aircraft. The various operations are explained and the characteristics of the set described. The report also includes schematics and block diagrams of the circuits employed.

PB 28644. BENZER, S. Photoelectric effects in germanium. (NDRC Rept 14-580) Oct 1945. 41 p. Price: Microfilm-$1.00 - Photostat-$3.00
Several types of photoelectric sensitivity in germanium to metal point contacts are described in this report from Purdue University. One type of characteristic, called the photodiode, shows photoconductive effects of great sensitivity, approaching unit quantum efficiency at a wave length of 13,000 A.U., with a white light sensitivity of several milliamperes per lumen. Photovoltaic effects also occur. A second type of characteristic, called the photopeak, has properties which enable it to be used as a trigger photocell. Many graphs are included.

PB 28571. MODZINSKY, ALBERT. Aircraft radio-anti-precipitation static and iron core D.F. loops, performance of. Final report. Jan 1946. 19 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report was rendered by the Office of Research and Inventions, Naval Research Laboratory. Five different standard and experimental aircraft direction finding loops and loop housings were submitted to a comparative study. These included as standard loops the LP-21-A, LP-21-F, and the MN24C; and as experimental loops, the XAS-153/ARN, the AS-138/ARN, and the LP-21-A with a graphite impregnated housing. These comparative investigations covered pick-up sensitivity, susceptibility to precipitation static, and mechanical features such as wind drag, weight and ruggedness. The results of this study indicate that the experimental loops offer no overall improvement over the present standard loops except for the AS-138ARN (Fighter) which combines a very low drag factor with good sensitivity. Results are shown in photographs and are also tabulated. An appendix is added to cover in detail themeasurement procedures used in these studies.

PB 31030. COLUMBIA UNIVERSITY. DIVISION OF WAR RESEARCH SONAR ANALYSIS SECTION. Fluctuation of transmitted sound in the ocean. Technical memorandum no. 6. (NDRC 6.1-1883) Jan 1945. 42 p. Price: Microfilm - $1.00 - Photostat - $3.00
This report summarizes known data and presents a preliminary theoretical analysis of the problem of the fluctuations of sound intensity from one ping to the next in received sound signals under water. Five mechanisms which may be involved in fluctuation are listed, showing possible effects, and the report also investigates importance of oceanographic factors, range, frequency, and hydrophone position. Possible influence of each is studied but no definite pattern emerges. Section II describes observations on temperature microstructure, which is regarded as theoretically responsible for some fluctuation. This fluctuation is analyzed in Appendix B. The general nature of this analysis is given in Section III, together with some results, and other factors important in fluctuation are discussed. Section IV discusses similar observational results on fluctuation obtained in studies of radio wave propagation and in studies of sound transmission in air. It is concluded that it seems likely that all the influences sometimes play a role in producing fluctuation, the relative importance of each depending on frequency as well as on the hydrophone range and depth. The evidence studied suggests that observations under more controlled conditions as well as a more complete theoretical approach are both required for an understanding of the fluctuations. Also included are mathematical appendices and a bibliography of 9 items.

PB 31178. DEIBEL, R. F., JR. Airborne radar and communication equipment. (AAF T-2 Air Tech Intelligence Review F-IR-65-RE) Jun 1946. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report outlines an interview with Lt. Commander Hitoshi Masaki on the types of radio and radar equipment in use by the Japanese Navy. This report discusses very briefly the latest Japanese models of radio transmitters and receivers, air-borne teletype equipment, Lorents blind landing equipment, radar antennas, airplane tail warning devices, interphone communications equipment, microphones, IFF equipment, and installations of air-borne radio and radar equipment.

PB 30485. BERICH, J. H. AN connectors. (AAF Material Command Memo Rept MMR -54-606-696) Oct 1943. 16 p. Price: Microfilm-$1.00 - Photostat-$2.00
The purpose of this study was to determine AN connector plug requirements and difficulties from the various aircraft and connector plug manufacturers visited on the West Coast, and including the American Phenolic Corporation, Chicago, Ill., Sep 19 to Oct 10, 1943. A list of the plants visited is given, and the discussions thereat are presented in Appendices I to XI inclusive. Conclusions and recommendations are also included.

PB 28832. ELLIS, R. E. and CRAIG, J. H. Report on development of broad band amplifier and modifications of RDA radio receiving equipment. (Naval Res Lab Rept R-2259) Apr 1944. 50 p. Price: Microfilm-$1.00 - Photostat-$4.00
This report concerns the development of a circuit having at least 30 mc bandwidth for use as an IF amplifier in early warning and search receivers. The complete circuit as developed for the RDA Receiver by the Auto Ordnance Corporation was given electrical and mechanical tests and field tests for performance. Some design changes were recommended. Many graphs, diagrams, photographs and tables are included.

PB 20827. ENGEL, A. Berechnung der charakteristik von richtantennen. (Calculation of the characteristics of directional antennas) (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik, V C 4) Aug 1939. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
This document "Ringbuch der Luftfahrttechnik" discusses the characteristics of directional antennas. The simple antenna forms, such as dipole antennas, linear antennas, and loop antennas, have a definite directional characteristics and by combining these antenna elements, antenna systems with any directional quality can be obtained. The analysis of the directional characteristic presumes also the knowledge of three-dimensional measurements as well as the knowledge of amplitude-and phase-conditions. In addition to the previous statements the influence of the glober surface must be considered. Graphs, diagrams and a bibliography of 22 items are included.

PB 28560. GERJUOY, H. Airplane detection by submarines. May 1944. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report was prepared by Columbia University, Division of War Research. Some computations have been made on the possibility of detection of an airplane by a submerged submarine using its JP-1 or some other acoustic gear. The results of these computations are reported in this memorandum and summarized at the end of the text, preceding the appendix. The numerical results quoted can only be obtained with the aid of considerable mathematical analysis which is not given. A qualitative geometric picture of the transmission of the sound from air to water is presented. The report is illustrated with graphs. The appendix gives a derivation of pressure in water from a ray diagram.

PB 28762. GOLDSTEIN, MAXWELL K. Special report on general facility and constructional requirements for the model DAJ direction finder installation. (Naval Res Lab Rept R-2079) May 1943. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report describes installation arrangements of a Navy model DAJ high frequency flash-bearing direction finder equipment and deals with the necessary preparatory, construction and installation work as well as the materials to be locally procured in advance. A complete DAJ installation is described, covering a continuous (1.5 to 30 mc) frequency range in four bands. Drawings for a preferred DAJ array arrangement and two alternate plans are shown.

PB 31179. HALLER, GEORGE L. Miscellaneous electronic documents. (AAF T-2 Air Tech Intelligence Review F-IR-71-RE) Jun 1946. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a list of documents on Japanese radar and radio equipment and research sent to the Air Documents Division, Wright Field, by the Advanced Echelon FEAF. Fifty documents are listed by title. Some are in Japanese, others in English.

PB 31060. HARTMANN, E. Vertical beam pattern measurements by pulse method. (OSRD Rept 1225; NDRC Rept 6.1-606) Feb 1943. 32 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report describes the technique and apparatus employed in measurements of vertical beam patterns of a QC type projector mounted with a retractable steel dome in the "forward sound" position of the U.S.S. Sommes. Results of observations taken by each of two methods are given. On the basis of these tests an approximate determination has been made of the "blind zone" below the projector for the conditions covered. Appendix A describes the gate circuit, shown in drawing USRL 626; Appendix B describes the signal level indicator which is shown in drawing USRL 635; Appendix C describes the "Single Sweep" and the "Grid Modulation" circuits of the oscilloscope used. A block diagram of the apparatus, vertical beam patterns, oscilloscope patterns are also included. This report covers work under contract with the Underwater Sound Reference Laboratories, Columbia University.

PB 28321. HENDERSON, FRED E. Design of radar test equipment, thermistors, at Siemens-Halske plant, Munich, Germany. (OFD Rept 14) n. d. 3 p. Price: Mimeographed-10¢.
This is a short report of investigation of the facility named. This firm had designed radar test equipment in the 30, 10 and 3 cm. range. They had also manufactured up to 1000 test sets per month at Asche, Czechoslovakia. These tests sets included frequency meters, power meters, range calibrators, and phantom targets. One of the most important developments completed by this group of engineers was a new type of thermistor that was produced in large quantities and which had the important characteristic of being extremely stable in its performance, and at the same time reacted much faster than the American glass bead type of thermistor. The method used in the manufacture of the thermistor is given in the report.

PB 28569. HERRING, R. A., JR. and others. Antenna duplexing. (Naval Res Lab Rept R-2213) Jan 1944. 38 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report concerns the development of duplexing systems using a single antenna for transmission and reception, the requisite switching operations being performed by an electronic switching device. This report is concerned only with frequencies below those which require the use of cavity resonators. The duplexing system must perform two functions; it must disconnect the receiver from the antenna during transmission to prevent overloading of the receiver as well as voltage breakdown of the tube insulation structures in particular, and to prevent loss of transmitted power into the receiver; and it must remove the transmitter from the antenna during reception to prevent loss of received signal energy into the transmitter circuits. A number of types of duplexing systems are described in this report and design and development problems are discussed. The report is illustrated with drawings and circuit diagrams.

PB 19216. HESS, H. A. and SCHULTZE, G. Bericht über den forschungsauftrag "kurzwellenausläufe" (Report on the research assignment "short wave propagation"). (ALSOS Mission, MIS 824 6) Jun 1943. 78 p. Price: Microfilm-$1.00 - Photostat-$6.00
This study treats the problem of radio wave propagation. A photographic device was built which recorded different echoes on an oscilloscope. Since the time-intervals of these echoes remained absolutely constant regardless of the weather, day or night time and season, the author assumes that the waves always traveled parallel with the circumference of the earth at a certain height and that these "head waves" radiate towards the ground and the echoes are caused by reverse or multiple propagation of the signal wave all or partly around the globe. Tabulations and graphs are appended. In German.

PB 36618. HORSTMANN. Zum aufbau von dipolreihen und dipolgruppen als längsstrahler (On the construction of rows and groups of dipoles as a longitudinal radiator). (Deutsche Luftfahrtforschung FB 1895) Jan 1944. 38 p. Price: Microfilm-$1.00 - Photostat-$3.00
This is a report of the "Ernst Lecher-Institut". The study on a report by v. Zinke on the subject "Fed dipole groups as a longitudinal radiator for wide frequency ranges" gave the occasion to investigate generally the horizontal radiation patterns of dipole-rows and dipole-groups. According to the results of the report by Zinke it was stated that the use of dipole-rows or dipole-groups as longitudinal radiators is basically restricted to wide band transmission. Graphs and drawings are included.

PB 28948. HUNT, G. L. Philips Valvo Works, Hamburg; Hammerwerke (valve works), Minden; C. H. Müller A. G. (X-ray tube factory), Hamburg. (BIOS Final Rept 65, Item 1) Aug 1945. 15 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report records the results of investigation of the named firms which were engaged in the manufacture of radio tubes. The facilities are described as to equipment, production and types of tubes produced. The appendix contains an organizational chart of the Philips Works together with a table of annual production in the period 1939 to 1945.

PB 20825. IRGLER, W. Funkpeilauswertung. (Radio direction finding evaluation) (Reichsluftfahrtministerium, "Ringbuch der Luftfahrttechnik," V C 1) Jan 1939. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This document "Ringbuch der Luftfahrttechnik" presents a summary of methods used for radio direction finding since its introduction. With the progress of direction finding distance, important consideration must be given to the spherical shape of the globe as well as to proper map projection. Also discussed are the various types of errors usually present in radio direction finding. Bibliography of 77 items are included.

PB 22569. JACOTTET, PAUL. Der einfluss dielektrischer scheiben in kreisxylindrischen hohlleitern unter besonderer berücksichtigung der bestimmung der stoffkonstanten mittels hohlleiterwellen (The influence of dielectric discs in cylindrical wave guides emphasizing the determination of the dielectric constants by means of the waves in the wave guides) (Reichsforschungsrat) (ALSOS Mission, MIS 809 A) Jan 1945. 82 p. Price: Microfilm-$1.00 - Photostat-$4.00
This is a mathematical study on the theoretical investigations with the view of supplying the mathematical basis for physical tests to determine the results when inserting dielectric discs into transverse polarized waves of a cylindrical wave guide. Graphs and drawings included. In German.

PB 22670. JACOTTET, PAUL Elektrische beanspruchungen in kreisxylindrischen hohlleitern (Electrical stresses in cylindrical wave guides). Reichsforschungsrat. (ALSOS Mission, MIS 809 A) Feb 1945. 26 p. Price: Microfilm-50¢ - Photostat-$1.00
The study develops mathematical formulas for the electric potentials in circular wave guides as a function of the modes of propagation, the frequency, the diameter of the wave guide and the strength of the current, for the purpose of determining whether or not high transmitting power will cause electric field breakdowns or corona discharges. The appendix contains graphs and tabulations.

PB 31057. JONES, REGINALD L. Wide range supersonic projector for calibration work. (OSRD Rept 4136; NDRC 6.1-1325) Aug 1944. 23 p. Price: Microfilm - $1.00 - Photostat - $2.00
The 6B Projector described in this report was developed by the Bell Telephone Laboratories primarily for laboratory test work. It is a relatively low power device that produces moderate sound pressures. Its most useful frequency range is from 10 kilocycles to 80 kilocycles per second. It will respond. It will respond to higher and lower frequencies however, and in situations where the rapid change in output below 10 kilocycles and the sharpness of the main beam above 80 kilocycles can be tolerated, it can be used from below 5 kilocycles to above 100 kilocycles per second. This instrument may be used as a hydrophone as well as a projector, and data on its performance as such are included in this report. A photograph, a diagram of the projector, directivity patterns, and graphs are also included. This report covers work under contract with the Western Electric Company.

PB 28963. KLEMM, S. C. Analysis of lengthening of modulated repetitive pulses. n. d. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00
This article comprises the material contained in Naval Research Laboratory report R-2655, July 3, 1945, with the addition of a section on pulse lengthening of circuits contributed by Dr. A. E. Hastings of the Naval Research Laboratory. It has been shown by Ming-Chen Wang and G. E. Uhlenbeck that if a pulse with repetition frequency f_0, periodically modulated by a signal with fundamental frequency f_m, is put through the ideal pulse lengthener, the expression for the output pulse contains terms with frequencies $sf_0 + qf_m$ where $s = 0, 1, 2, \ldots$ and $q = \ldots, -2, -1, 0, 1, 2, \ldots$ The amplitudes of terms with frequencies sf_0 ($s = 1, 2, \ldots$; $q = 0$), however, are zero. The present article contains a derivation of the result in more detail than they gave, and without the restriction to the ideal case. In the present derivation, the pulse form is taken initially to be quite general. Both a formula and graphs are then presented for the amplitudes associated with the output frequencies of the pulse lengthener, when the output pulse height decays exponentially with the time constant α^{-1}, and lasts throughout the fraction β of the interval between pulses. This reduces further to the ideal case when $\alpha \to 0$ and $\beta = 1$. The frequencies sf_0 ($s = 1, 2, \ldots$) are ordinarily present, except in the ideal case. An example of a pulse lengthening circuit is given.

PB 20826. KRAMAR, E. Richtfunkfeuer und drehfunkfeuer. (Directional radio beacon and rotating radio beacon) (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik, V C 3) Sep 1938. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
This document "Ringbuch der Luftfahrttechnik" discusses directional and rotating radio beacons and methods with which they are used as navigational aids. In contrast to the omni-directional radio beacons described here, the directional and rotating radio beacons radiate signals with a definite code. Graphs, diagrams, photographs, and a bibliography of 47 items are included.

PB 31029. LOYE, D. P. and others. Sound transmission tests at low and high frequencies. Memorandum, Sep 10 to Nov 18, 1942. (NDRC Rept 6.1-561) Dec 1942. 23 p. Price: Microfilm - $1.00 - Photostat - $2.00
This report from the Columbia University Division of War Research is part of a study of ship noise and harbor noises for the effective use of sonic harbor protection systems. San Diego and New London measurements are reported in this study. Tests are described, theoretical considerations given, conclusions drawn, and the results evaluated in this publication. It indicated that for frequencies of 1000 cycles or greater, the average transmission loss is approximately 6 db per distance double, which is in accordance with theory. For low frequencies of approximately 200 cycles and lower, the average transmission loss measured was 11 db per distance double, due not only to the spread of the sound but to interference between the direct and surface reflected sound. Many curves are included.

PB 28332. MCCARTHY, R. H. and others. Investigation of Phillips Valve Lokstedt plant, Hamburg: Vacuum tube production. (OPB Rept 27) n. d. 2 p. Price: Mimeographed-10¢

This is a modern plant for quantity production of a commonly used pentode vacuum tube. It is a modern plant capable of producing 3000 such tubes a day. The rejection rate was about 25%. Nothing of extreme novelty was noted in this plant. The production machinery was well designed and arranged and while capable of producing good products did not operate at rates approaching current practice in the USA. Of particular interest was the grid winding machine which automatically wound the good wires into nicks, rolled in the supporting wires, and stacked them into position. This plant is a unit in a network of Phillips plants manufacturing widely used types of vacuum tubes.

PB 28327. MCCARTHY, R. H. and others. Questioning of Dr. Ludwig Wesch, Director of the Institutes of Weltpost und Weltnachrichtenwesen and the Elektro-Optisches Institut at Prison Heidelberg. (OPB Rept 22) n. d. 1 p. Price: Mimeographed-10¢.
This brief report merely lists the fields in which Dr. Wesch has done research and states that a long report in German has been prepared dealing broadly with a discussion of phosphors, dielectric constant photocells, dielectrics for bolometers, triodes and magnetrons for cm. waves, capacity feed back generator using dielectric constant photocell, general work on infra-red, high pressure high temperature oven (for phosphors), absorption of cm. waves andproblems of remote control of moving vehicles, such as planes, gliders and rockets.

PB 28333. MCCARTHY, R. H. and others. Questioning of K. Weigel, technical director of CHF Muller AG, Hamburg: Vacuum tube production, X-ray tube production, electron optics, magnetrons high voltage equipment. (OPB Rept 28) n. d. 2 p. Price: Mimeographed-10¢.
This is a report of an interrogation regarding the production and products of CHF Muller, A. G., Hamburg. This plant did developmental work; research was done elsewhere. X-ray tubes for dental, ordinary medical, deep therapy and industrial uses were manufactured. The firm also made a part for underwater sound equipment which was merely the electrical tuning circuit of the receiver. Complete equipment was available for high voltage testing. Two types of rectifier tubes were made, AC-50 a small triode, and EC-50, a special triode. These rectifier tubes consisted of molybdenum glass to which were sealed electrodes of stainless steel (20 to 25% chromium). These are piled end on, with the electrodes brazed together. About 10 units were used in a 300 kv. tube.

PB 31017. MASSACHUSETTS INSTITUTE OF TECHNOLOGY. Transmission loss of underwater sound off Block Island. (NDRC Rept 6.1 - 1058) May 1944. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The transmission of underwater sound between 150 and 800 yards was studied off Block Island at frequencies of 5, 10, and 20 kc. Sound sources used were a towed noisemaker and a destroyer escort at speeds between 8 and 26 knots. An analysis of 560 curves shows that the intensity decreases on the average 5 1/2 db for each doubling of the distance; individual runs show wide scatter from this result. In preparing this report, the term "attenuation" has been used to denote the slope of the curve found when sound intensity in db is plotted against the logarithm of the range. Table and curves are included.

PB 20823. MESSERSCHMIDT, W. Charakteristiken von spiegelreflektoren. (Characteristics of reflectors) (Reichsluftfahrtministerium, Ringbuch der Luftfahrttechnik, V C 5) Jun 1939. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This document "Ringbuch der Luftfahrttechnik" discusses reflectors used for the beaming of very short waves up to and including ultra short waves. The most important results which are taken from various publications are compiled in this article. The directional characteristics of plane and parabolic reflectors are presented in a useful form. Graphs, diagrams and bibliography are included.

PB 31194. MOSELEY, T. I. AIA-1 scanner development program. Progress report. (NDRC Rept 14-321) Aug 1944. 75 p. Price: Microfilm-$2.00 - Photostat-$6.00
The Dalmo Victor, Inc. (San Francisco) development program was concerned with the design of a light-weight, airborne, high-speed spiral scanner. This report describes nine suggested refinements which were recommended in a previous report. In addition, certain other refinements were considered and are reported in Section II of this report. In section III will be found proposals for future investigation. Six appendices cover work on generators, the solenoid, potentiometers, the Westinghouse reports on motors and the scanner, and the Radiation Laboratory report on pressurizing the scanner. The report is illustrated with photographs, graphs, numerous diagrams and operational data and specifications.

PB 31213. NORTH, H. Q. X-band germanium crystals. Bimonthly progress report, Dec 15, 1944 - Feb 15, 1945. (NDRC Rept 14-406) 1945. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
Improvement in performance of the germanium crystal was obtained by abandoning the standard polarity. A diagram illustrates the change in design. The report also describes, briefly, work on the following: Determination of the most suitable diameter of platinum - 10% ruthenium whiskers; conversion loss; purification and treatment of germanium; X-band phosphorus-doped units. For later report on this subject, see PB 5206, reported in this Bibliography, V. 1, p. 357. These reports cover work under contract with General Electric Company, Research Laboratory.

PB 31007. PEKERIS, C. L. Asymptotic solutions for the normal modes in the theory of microwave propagation. (Columbia Univ. Mathematical Physics Group Rept 4) May 1946. 48 p. Price: Microfilm-$1.00 - Photostat-$4.00
In this paper are presented several extensions of the "W.K.B." method in the asymptotic solution of differential equations. In section 1, a brief outline is given of the new standard normal-mode theory of propagation of microwaves in an atmosphere with a horizontally stratified index of refraction. Particular emphasis is given in this study to the case of a "surface duct". The case of "leaky modes" is studied in section 2. In section 3 a direct method is given of determining the characteristic values from the phase-integral relation. If the modified index of refraction is given by a power series, one can compute directly the characteristic value by use of the formulas given. The degree of success is illustrated in Table I. The principal contribution of this study is in the development of asymptotic solutions for the case of transitional modes which are on the border line between the leaky modes and the trapped modes. The standard "W.K.B." method is inapplicable in this case. Calculations and a diagram are included.

PB 31015. PROUDFOOT, D. A. Underwater sound survey; New York Harbor approaches. Completion report. (OSRD 1862; Rept 6.1-794) Aug 1943. 41 p. Price: Microfilm - $1.00 - Photostat - $3.00

This report from the Columbia University Division of War Research is an underwater sound survey of New York Harbor approaches to obtain information pertinent to the proposed installation of sonic detection devices. The effective use of sonic devices for harbor protection requires this knowledge of background noise and sound transmission characteristics of the water. Considerable additional data of a more general nature is also included to be used as a basis in making intelligent predictions of conditions for installations in other harbors. The equipment used and measurement techniques are explained. The evaluation of the noise and transmission characteristics of the water in terms of depth, bottom characteristics, turbidity and other oceanographic factors was studied. It was found that under most conditions, the transmission loss increased with the increase in frequency, and that smooth hard sand is better for the transmission of sound. These findings are to be compared with similar studies made in the San Diego Harbor. Maps, diagrams and many curves are included.

PB 31035. SHRADER, E. F. Production testing of projectors. (OSRD Rept 3798; NDRC Rept 6.1-1622) May 1944. 79 p. Price: Microfilm-$2.00 - Photostat-$6.00

This report from the Columbia University, Division of War Research, Underwater Sound Reference Laboratories, describes certain acoustic methods for production testing of underwater sound projectors and hydrophones. Two methods of overcoming the difficulty of reflections in small testing tanks were studied at the Mountain Lakes test station. These were (1) Lining the tank with absorbing material so as to reduce the magnitude of reflections (2) Using pulses of short duration and measuring the acoustic signal before any reflections from the tank walls interfere. Tests made by each method are described and evaluated. It was found that some tests are more readily made by pulse measurement. For directional response measurements and for tests requiring measurements of characteristics as response, directivity and impedance, measurements are more readily made by the use of a suitable absorbing tank. Appendix A describes circuits for pulse generator and receiver modulator, Appendix B the sound field of the pulse excited diaphragm. Appendix C gives a spherical wave correction. Appendix D gives Western Electric's QRF production testing method. Many directivity patterns, curves, schematics and diagrams are included.

PB 28646. SMITH, R. N. Crystal capacity as a function of bias and its relation to the theory of crystal rectification. (NDRC Rept 14-584) Mar 1946. 31 p. Price: Microfilm-$1.00 - Photostat-$3.00

Contact capacities of silicon and germanium rectifier units have been measured as a function of DC bias. The usual model of a crystal rectifier consisting of a variable contact resistance, contact capacity and fixed spreading resistance has been used, and the capacity calculated from the low level efficiency of rectification at S and X band in this report from Purdue University. Silicon units show a capacity dependence which is in qualitative agreement with predictions of Bethe's diode theory of crystal rectification. Germanium rectifiers, however, at forward biases of about one-half volt or more than abnormally poor rectification at high frequencies. In terms of the usual rectifier model this would require a large contact capacity at high forward biases, much larger than can be explained by present natural barrier theories of rectification including the multi-contact potential theory. The crystal model has been examined in detail to see if an alternative explanation of this behavior can be found. An increase of spreading resistance with frequency is excluded by the existence of negative IF conductance in General Electric welded germanium units. Temperature and field effects in the contact do not give a satisfactory explanation of the poor germanium output at high forward bias at high frequency. Assuming then that a large contact capacity must exist a surface barrier between the normal barrier and the metal whisker is postulated. Graphs and references are included.

PB 31019. SNOW, W. B. and others. Transmission measurements in the vicinity of San Diego, Cal. Completion report. (NDRC Rept 6.1-1574) Sept 1944. 63 p. Price: Microfilm - $2.00 - Photostat - $5.00

This study of shallow water sound transmission measurement in the vicinity of San Diego, California is a part of the cooperative study undertaken by the Columbia University Division of War Research, the University of California Division of War Research, and the Massachusetts Institute of Technology Division of Industrial Cooperation. The receiving measurement techniques were substantially the same as those used in the New York Harbor except that a continuous broad band source was used rather than a single frequency source. The survey program was divided into three phases; transmission, ambient noise and oceanographic measurements. Procedure and equipment used are described. Measurements made by the two groups were substantially in accord. It was found, when extended to deep water, that reflections from the bottom contributed significantly to the received intensity for all frequencies measured. Evidence of the Lloyd Mirror effect was found at low frequencies. Many curves, charts, maps and tables are included. See PB 31018.

PB 31018. SNOW, W. B. and others. Transmission survey, Block Island Sound. Completion report. (OSRD Rept 3511; NDRC Rept 6.1-1027) Mar 1944. 108 p. Price: Microfilm - $3.00 - Photostat - $8.00

The placement of sonic detection equipment for optimum response requires the knowledge of background noise levels and the transmission characteristics of the water. The present report from Columbia University Division of War Research at the U. S. Navy Underwater Sound Laboratory, New London, Conn., describes the methods and results of surveys conducted in Block Island Sound in the vicinity of Fishers Island and Block Island. The survey included both acoustical and oceanographic measurements. The acoustical data consisted of background noise and transmission loss measurements. Various conclusions are presented herein. Appendices present background noise measuring technique, transmission and oceanographic data, and statistical analysis of data. Tables, diagrams of noise, measuring, sound projecting and receiving equipment, charts and graphs are included.

PB 28897. SWINNERTON, ALLIN C. Report of investigations in European Theater, with special reference to the German ersatz quartz program and wartime crystal industry, and the quartz developments and piezoelectric materials investigations in the United Kingdom. Jan 1946. 40 p. Price: Microfilm-$1.00 - Photostat-$3.00
In the introduction of this report, the author gives the status of the U. S. Signal Corps quartz alternatives program. Since enemy information was lacking it was proposed that a visit be made to the European Theater, including the United Kingdom, for the purpose of establishing coordination with the British Subcommittee of Piezoelectric Materials, of examining further the progress made by German scientists in their search for piezoelectric substances and the methods used in the growth of these materials, and of investigating the German wartime quartz crystal industry for whatever background and technical information it might yield. The sources of information on ersatz quartz are summarized. In addition to interrogations of enemy personnel, two French scientists were interviewed. The German ersatz quartz program of development is discussed. Three different experimental methods of growing quartz were proposed: a hydro-thermal method, low-temperature melt and a reaction technique based on $SiCl_4$. Only the hydro-thermal method was successful and was set up in production before V-E Day. A large portion of the report is taken up with the recounting of information gleaned through interrogation of the chief researchers on the subject. Miscellaneous additional facts and comments based on impressions and inference are included in the author's comments on German wartime crystal industry and related subjects. The measures adopted to save raw quartz are listed. French and British crystal manufacturing techniques are discussed briefly. The only possibly promising material which was not included on Signal Corps lists of substances to be investigated was artificial nepheline, sodium aluminum silicate. The outstanding German developments included use of small crystals, extension of the use of plated crystals, and, notably, the fabrication of very high frequency (60 mc) crystals for V-2 application. The extensive use of circular crystals is noteworthy; also the series resonance application in calibrator circuits. The German fabrication techniques were neither modern nor efficient. Extremely high frequencies were attained experimentally with tourmaline plates. Sketches, figures and photographs.

PB 28285. TUCKER, L. M. Filter, Solar Manufacturing Company type RA-161, Solar sample S-2423-A. (AAF ATSC Eng Div Memo Rept TSEPE-656-484-RI) Jan 1946. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00
The purpose of the investigation described in this report is to determine if the subject filter can satisfactorily be used with type RIY2PB Dumore Motor to reduce radio interference to the limits required by specification AN-M-10a for a filtered motor. Test procedures are described, and test data shown in appendix 1. It was concluded that the subject filter satisfactorily reduced the radio interference voltage generated by the operation of Dumore Motor type RIY2PB.

PB 28509. U. S. ARMY SERVICE FORCES. Sounder test panel (monitor), Japan: Captured radio communications equipment, preliminary report. Sep 1944. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report concerns a captured Japanese 3-tube audio-frequency amplifier with three parallel input channels. The output can be switched to either the headphones or to a polarized relay which operates a buzzer. Its possible use cannot be determined, lacking pick-ups, cables and accessories, but it may have been a sound locator or an alarm for a telephone switchboard. A data table and many photographs and diagrams are included.

PB 33509. U.S. NAVAL ORDNANCE LABORATORY. Specification of equipment for calibration and channel ranges. (Mine Unit Rept 305). Sep 1941. 183 p. Price: Microfilm-$4.00 - Photostat-$13.00
Specifications for each item of calibration and channel range equipment are given, together with information concerning suppliers, cost and time of probable delivery. A formula is given for estimating the total cost of ranges using either Mark 3, Mod. 3 or Mark 4, Mod. 2 coils, and having either permanent or temporary instrument house installations. A complete set of specification drawings is attached. Appendices, as follows, are included: "A", Item-number index of calibration and channel range equipment; "B", alphabetical index of calibration and channel range equipment; "C", index to calibration and channel range drawings; "D", list of suppliers; "E", multiple shunt unit and switch.

PB 33515. U.S. NAVY YARD, WASHINGTON, D. C. The Beckoning Point Magnetic Proving Ground. (Naval Ordnance Lab Rept 747). May 1943. 76 p. Price: Microfilm-$2.00 - Photostat-$6.00
This report discusses the Beckoning Point Proving Ground at Pearl Harbor as of September 1942. The layout, dimensions of both deep and shallow ranges are described in detail, together with the Z loop, power for degaussing, and mooring facilities. The factors limiting precision of measurement are considered and results of experimental checks are presented. Also included are general descriptions of methods of measurements, underwater magnetometer installation, adaptation of automatic recorders to the range, and power supply for the magnetometers. A final section deals with maintenance of the instruments and trouble-shooting. Tables, photographs and magnetometer layouts are included.

PB 33514. U. S. NAVY YARD, WASHINGTON, D. C. Control panels for advance-base magnetic ranges. (Naval Ordnance Lab Rept 707) Jul 1943. 148 p. Price: Microfilm-$3.00 - Photostat-$10.00
Control panels for double-level magnetic survey ranges at advance bases are described in detail. Considerations in choosing a location for the control equipment are presented together with installation instructions. Method of checking and adjusting fluxmeters, measuring resistance to ground, and other necessary testing and operating instructions are included. A general discussion of trouble-shooting is also given. Tables, assembly and wiring diagrams are included.

PB 33510. U. S. NAVY YARD, WASHINGTON, D. C. The Lambert's Point Demagnetizing Station. (Naval Ordnance Lab Rept 332) Jun 1942. 92 p. Price: Microfilm-$2.00 - Photostat-$7.00
This demagnetizing station (Cranay Island) is designed to flash ships, to deperm them by reversals with both vertical and horizontal fields, and installed to carry out emergency calibration and adjustments of degaussing apparatus. The general physical characteristics of the station are described. Circuit specifications for the flashing loop, deperming gear,

neutralizing solenoid, and Z loop are presented, and details concerning battery supply, charging generators, and other power apparatus are described with considerable care. Complete calculated electrical performance of the station is given which checks against actual operation. The magnetometer arrays, detector installations, and general physical layout are also presented. Reduced prints of specification drawings and schematic and wiring diagrams are included for reference. Tables and graphs accompany the report.

PB 33511. U.S. NAVY YARD, WASHINGTON, D. C. Magnetic proving grounds for study of ships' magnetic fields. (Naval Ordnance Lab Rept 562). Nov 1943. 184 p. Price: Microfilm-$4.00 - Photostat-$13.00
The magnetometer proving ground was developed to meet the need for comprehensive, precise, fast measurements of the magnetic state of a ship, allowing the ship to be treated and measured in a fixed position. Magnetometers, installed on nonmagnetic pipes set in fixed vertical positions under the ship, provide measurements of the vertical components of the ship's field. A keel row, with a north-south or east-west magnetic heading, and several athwartship rows are arranged in a horizontal array covering an area somewhat larger than the ship. By means of dolphins, the ship is moored and held in accurate position over this array. In this report the requirements for choice of a site and general layout of buildings and instruments are described; proper methods for installation, test, and operation are given for the detectors, control panels, power supplies, automatic recorders, and auxiliary equipment. Service and maintenance instructions are included. Photographs, block diagram, circuit diagrams, schematic diagrams, tables and graphs accompany the report. Appendices present installation instructions and general data for the following: "A", detectors; "B", control system, "C", stabilizer; "D", oscillator: "E", Speedomax.

PB 28298. WINSTON, C. B. Radio noise tests on General Electric filters. (AAF Material Center Memo Rept EXP-M-54-656-543 C) Oct 1942. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
Tests were conducted on the subject filters to determine compliance with Army Air Forces specification no. 32331. These tests were conducted with one of the 100 ampere models of the subject filter installed in the power input to a General Electric-Martin amplidyne turret control. They were also conducted on one of the 200 ampere models of the subject filters installed in a standard aircraft electrical system using a General Electric type R-1 generator. This report recommends that the Army Air Forces specification 32331 be modified to provide tolerance in requirement for attenuation; that the subject filters be approved for use on aircraft electrical equipment where filters are required.

PB 18502. WÜSTNER, HERMANN. Funkpeilzerstörer. (Radio direction finding jammer.) (MIS VII 68 a 12 7002045) Apr 1938. 10 p. Price: Microfilm - 50¢ - Photostat - $1.00
A German patent application including correspondence related thereto pertaining countermeasures against the location of radio transmitters by means of direction finding. It is proposed to effect this by continuously changing either the signal strength of an omnidirectional antenna of the direction of a directional antenna. In German.

PB 28645. YEARIAN, H. J. Dependence of forward conductance and back resistance of high back voltage germanium on voltage and frequency. (MDRC Rept 14-581) Oct 1945. 42 p. Price: Microfilm-$1.00 - Photostat-$3.00
The rectified DC, when 60 cycle to 60 mc voltages are applied to high back voltage Ge rectifiers, has been measured. The ratio of the rectified current at a higher frequency to that at 60 cycle is approximately unity at very low voltages and decreases at higher voltage, approaching a constant value. The effective back resistance of the crystal at 1 KC and that at 30 mc have been compared in three types of circuits at voltages up to 30 volts in this report from Purdue University. The relation between the effective back resistance of the crystal and its i-V characteristic, and the use of crystals in RF voltmeters, are discussed in appendices. Graphs and references are included.

Generators, Motors, Transmission, Distribution and Allied Equipment

PB 30496. BAMBER, W. A. Tests of self-excited alternator with electronic voltage regulator. (AAF Material Command Memo Rept EXP-54-656-9082) Feb 1944. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
The alternator which was tested at the General Aviation Equipment Co. is a conventional single-phase AC motor which was reworked so that it could be tested as a single-phase alternator at 400 cycles per second. The unit is rated at 1 KVA, 115 volts and gets its excitation by means of the electronic voltage regulator. Performance data are shown on graph. It was concluded that electronic-voltage regulator definitely has possibilities for use in the alternating current electrical system for aircraft.

PB 30502. COBB, H. E. Power plant type D-2, load test. (AAF Material Command Memo Rept EXP-54-656-8848) May 1944. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report presents results of tests on Andover Motors Corporation and Lawrence Engineering & Research Corporation AAF type D-2 accessory power plants with load limiting resistance in the generator field circuit. Procedure and test results, conclusions and recommendations are given. It was concluded that improvement in D-2 plant overload capacity can be obtained by insertion of resistance in the generator field circuit; and when starting the auxiliary power plant by using the generator as a motor, it is necessary that the field resistor be shorted out. Graphs are included.

PB 30840. DAVIS, R. E. Inverter installation in the B-29 airplane. (AAF ATSC Memo Rept TSEPL-3-656-9949) Nov 1944. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report records conferences held at Boeing Aircraft Corporation, Seattle, Washington, October 19 to 23, 1944, on the modification of the AC power system in the B-29 airplane to accomodate special radar equipment. Some difficulty had been experienced with the automatic inverter changeover relay, already in use in production B-29 airplanes, and proposed as an essential feature of the system, consisting of two 2500 VA inverters, outlined in schematic drawing in Appendix I. Conclusions and recommendations are presented.

PB 30498. GREEN, W. M. Terminal block for type A-1, 40 KVA, 200/115 volt, 3 phase, 400 cycle, alternator. (AAF ATSC Eng Div Memo Rept TSEPL-3-656-909J) Aug 1945. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
The purpose of this study was to decide upon a standardized terminal block arrangement to be incorporated in Army Air Forces specification 94-32509 (Type A-1 alternator) in order that the wiring harness in the airplane may fit any alternator. The General Electric unit had two terminal block designs, and the Westinghouse had one. Appendices I and II show these three arrangements. The terminal arrangement shown in Appendix III was circulated to all interested organizations for comments. It was concluded that the block design shown in appendix IV incorporates most of the desired features for the final terminal arrangement.

PB 28293. GREEN, W. M. Test of Leland 250-volt ampere inverter for Aircraft Radio Laboratory. (Army Air Corps Materiel Div Memo Rept EXP-M-54-656-541 B) Jul 1942. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00
Aircraft Radio Laboratory tests on a 250-volt ampere, 115-volt, 400-cycle inverter with 12-volts input to run the automatic radio compass on airplanes of the C-47 type which have 12-volt D. C. electrical systems are described. It is concluded that the design of the inverter is not suitable for operation at 90 percent power factor; that the inverter is considerably over-rated, only being able to deliver 100 of the 250-volt amperes with any degree of satisfaction; that the physical construction of the inverter is not suitable for the long life of at least 1000 hours required by the specification. It is recommended that the inverter be considered unsatisfactory for the requirements of the Aircraft Radio Laboratory and therefore be rejected. Graph is shown in appendix 1, and performance of the inverter is discussed in appendix 2.

PB 28292. GREEN, W. M. Tests of Lear Avia 250 volt ampere inverter for Aircraft Radio Laboratory. (Army Air Corps Materiel Div Memo Rept EXP-M-54-656-541) Jul 1942. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00
Subject inverter with 12-volt D. C. input is required to obtain suitable 115-volt, 400-cycles, single phase alternating current to run the automatic radio compass in C-47 and similar airplanes with 12-volt D. C. systems. Tests are described. It is concluded that the inverter has unsatisfactory voltage regulation; and that the short life of the inverter indicates completely unsatisfactory construction. It is therefore recommended that the inverter be rejected. A graph is given in appendix 1, and performance of the inverter is discussed in appendix 2.

PB 30511. HAGEDORN, A. A. Generator, engine driven, AAF type P-1, made by Westinghouse Electric and Manufacturing Company. (AAF Materiel Command Memo Rept ENG-54-656-866) Sep 1943. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report presents results of engine tests of sample cast steel mounting flange for subject generator. It was concluded that performance was satisfactory. This report will not reproduce well.

PB 28291. HERMAN, R. H. Generator, Army Air Forces type P-2, Eclipse Aviation part no. E-101294. (AAF Materiel Center Memo Rept EXP-M-54-656-540) Sep 1942. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report describes subject item and laboratory tests to determine compliance of subject generator with the AN specifications for class A, 200 ampere generators. It was concluded that this generator did not satisfactorily pass the AN specification tests performed on it; specifically the heat run in which the terminal voltage could not be maintained at the specified 30 volt value. Load speed characteristic and results of heat run test are discussed in appendix II. Curves of tests are plotted in Appendices III, IV and V.

PB 31943. MCMILLAN, EDWIN M. Violation of the reciprocity theorem in linear passive electromechanical systems. May 1946. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
In this report from the Radiation Laboratory, University of California, a simple energy argument is used to show that the theorem of reciprocity is not necessarily valid for linear passive electromechanical systems. It is found that in the case of crystal or electrostatic transducers the theorem is satisfied, while in the case of magnetic or electrodynamic transducers it is satisfied in magnitude but not in sign. It is further shown that by combining the two types of transducers, systems can be constructed that violate reciprocity in magnitude. Diagrams of electrical systems are included.

PB 30492. POHORZER, EMIL. Switch, generator control relay (Differential AN-3025-1), Hartman Electrical Mfg. Co. P/N A-700. (AAF ASTC Eng Div Memo Rept TSEPL-3-656-906J) May 1945. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report presents results of endurance and interrupting capacity tests conducted on subject relay to compare contact materials from three different manufacturers: Baker Company, Stackpole Carbon Co. and P. R. Mallory Co., Inc. Test procedures are described in Appendices I and V, results of endurance tests are listed in Appendices II, III and IV, and results of interrupting capacity tests are given in Appendices VI, VII and VIII.

PB 30490. POHORZER, EMIL. Tests of resubmitted Westinghouse Electric & Mfg. Company generator control relay (differential), mfg. type no. AVH67-A. (AAF Materiel Command Memo Rept ENG-54-656-906C) May 1944. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
Tests were conducted to determine whether this relay, rated 300 amperes, 28 volts DC, can be used to control 300 ampere generators. Conclusions and recommendations are presented in this report. Appendix I contains a description of the temperature, load and sand tests. Results of vibration tests are shown graphically in Appendix II.

PB 33513. U.S. NAVY YARD, WASHINGTON, D. C. The Mark 1, mod 1, control panel for magnetic channel loops. (Naval Ordnance Lab Rept 703). Dec 1942. 55 p. Price: Microfilm-$2.00 - Photostat-$4.00
This report gives a description of the panel and complete operating instructions. A set of sketches and photographs fully specifying its construction are also included. Appendix A consists of tables.

PB 30850. YOUNG, R. B. AAF type D-2 accessory power plants, Andover Motors Corporation. (AAF Materiel Command Memo Rept ENG-54-656-944) Dec 1943. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report covers a conference with engineers of Andover Motors Corp. at the Materiel Command on Dec 20, 1943, regarding vibration damping on the Andover Model V-32 (AAF type D-2) accessory power plant. It was concluded that the numerous breakages of generator quill shafts from torsional vibrations are due to the fact that the frequency of the exciting vibrations from the engine coincide with the natural resonant frequency of the generator at certain operating conditions, and indicate the desirability of critically damping the generator drives against resonant vibrations throughout the entire range of operating frequencies.

Miscellaneous

PB 30488. CROWLEY, H. J. Lamp assembly; acetylene, portable. (AAF Materiel Command Memo Rept Eng-54-656-905) Nov 1943. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report presents results of tests at American Gas Accumulator Co., Elizabeth, N. J., October 18-19, 1943, on the operation of subject assembly, an experimental unit designed principally to meet the demand for lighting obstructions where electric power is not available. A description of the unit and changes agreed upon are given in Appendix I. Tests and results are described in Appendix II.

PB 30861. CUNNINGHAM, C. B. A light-weight crystal vibration pick-up. n. d. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
Subject item was developed for use with a commercially available vibration meter for measuring the vibrational characteristics of the resilient mountings of small aircraft units. The sensitive element of the lightweight pick-up is a small rochelle salt "bimorph bender" piezoelectric crystal, and is enclosed in a lucite case. A photograph of the pick-up is shown, as well as sketch of the pick-up case with the crystal located for cementing. Another photographs shows the comparative size of the lightweight and the standard pick-ups. The shop drawings for the case and covers of the lightweight pick-up are also shown.

PB 30808. DUGGER, EDWARD. Storage battery cases. (AAF Material Command Memo Rept ENG-54-656-885) Sep 1943. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
Tests to determine the conformity of three storage battery cases, manufactured by the Frost-o-Lite Battery Company, to the tensile and elongation requirements of specification AN-W-B-141, are reported. It was concluded that the material in the three subject cases conforms to the tensile and elongation requirements of the specification noted. Test data are shown in tabular form in appendix I.

PB 30804. DUGGER, EDWARD. Storage battery cases. (AAF Material Command Memo Rept ENG-54-656-886) Oct 1943. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
Tests to determine the conformity of two storage battery cases, manufactured by the Electric Storage Battery Company, to the tensile and elongation requirements of specification An-W-141, are reported. It was concluded that the material in the two subject cases conforms to the tensile and elongation requirements of the specification noted. Test data are shown in tabular form in appendix I.

PB 30842. FRIEDRICH, E. J. Indicator assembly; Dietz Teller. (AAF Material Command Memo Rept ENG-54-656-1074) Jun 1944. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
Results of tests conducted on four samples of subject assembly, submitted by the Dietz Mfg. Co., Los Angeles, Cal., on Apr 12, 1944, to determine their suitability for aircraft use, are presented. Descriptions of the item and the tests are given. It was concluded that these sample Dietz Teller indicator lamp assemblies are satisfactory for use on aircraft with respect to life, high altitude operation, and resistance to effects of extreme temperatures, but are rendered unreliable by humidity, and are not sufficiently resistant to vibration to permit their use except on shock-mounted panels; such defects in performance as were revealed by these tests may possibly be corrected by suggested minor changes in construction.

PB 30837. FRIEDRICH, E. J. Taxi lamps. (AAF Material Command Memo Rept ENG-54-656-994) Mar 1944. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
Results of an investigation conducted in order to secure data on the installation of lamp assemblies suitable for use as taxiing lights in night fighters, bombers, and transport aircraft, are presented in this report. Procedure, installation methods, conclusions and recommendations are included. It was found that two Mazda No. 4502, 50 watt, 28 volt lamps are satisfactory except in the case of extremely large aircraft. (See PB 30838 for a further study under this project).

PB 30803. SIEGMAN, E. E. Cable, quick disconnects. (AAF Material Command Memo Rept ENG-54-656-890) Oct 1943. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00

Results of conference held at the Thomas & Betts Company, Elizabeth, N. J., in connection with quick disconnect cable terminals and disconnect cable splices on Sep 28, 30, 1943, are presented. Drawings are included. It is concluded that quick disconnect cable terminals can be used to definite advantage on aircraft electrical equipment and two-way disconnect splices in aircraft wiring to replace terminal blocks.

PB 30838. GREENLEE, P. H. Taxi lights. (AAF AFSC Eng Div Memo Rept TSEPL-3-656-994A) Aug 1945. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report covers a study made to determine the feasibility of adding an additional filament to the present AN3130-4560, 600 watt, PAR-64 bulb, Mazda 4502, landing lamp for use as a taxiing lamp. Memorandum report serial no. ENG-54-656-994, dated March 17, 1944, "Taxi lamps" (PB 30837) presents the results of the original study made under this project. Two lamps with 150 watt filaments in addition to the 600 watt filaments were installed on a B-17 airplane and were found not satisfactory.

PB 30487. GREENLEE, P. H. Vibration test of 3 volt, 0.19 amperes, T-1 1/4 bulb, lamp with solderless B and M bases. (AAF Material Command Memo Rept ENG-54-656-904) Oct 1943. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
Results of subject test conducted to determine suitability of lamps with bases of solderless construction for use on Army Air Forces airplanes are presented in this report. Test procedure is described. It was concluded that Mazda No. 319 lamps with solderless bases are suitable for use on aircraft.

PB 30506. GREENLEE, PAUL H. Vibration test of 28 volt, 17 amperes, T-3 1/4 bulb, miniature bayonet base lamps with two filament supports. (AAF Material Command Memo Rept ENG-54-656-907) Jul 1943. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report presents results of subject tests. It was concluded that lamps with two filament supports are more suitable for use on aircraft than those with one support.

PB 31186. JACOBSON, M. Electric batteries: Low temperature characteristics of batteries for electric safety brake system on mobile gun carriages. (Watertown Arsenal Lab Memo Rept 770/22) Mar 1944. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
Tests described below were performed on three 6 volt dry batteries designated "A", "B", and "C" and a 2 volt wet battery designated as "D". Manufacturers are not given. The low-temperature output characteristics of "A" hot-short batteries, which have been issued for use on gun mount safety systems by the Field Service Division of this Arsenal, are considered very inadequate. The momentary short-circuit current decreases rapidly with decrease in temperature until at -34° F less than two percent of the normal amperage is available. The behavior of the "B" battery at low temperature is considerably better than that of the "A". The dry cell discharges 3.5 amperes for about 80 minutes at -20° F before a cut-off voltage of three volts is reached. The capacity of the "C" is superior to that of the "A", although somewhat less effective than the "B". At -20° F the battery discharges 3.5 amperes for approximately 25 minutes before a terminal e.m.f. of three volts is attained. At sub-zero temperatures the capacity of the lead-acid type "D" sample (tested as a series-connected battery of three cells) is markedly superior to the three dry cells examined in the present tests. When tested at -40° F the "D" discharges 3.5 amperes for 125 minutes before the terminal e.m.f. reaches three volts. Appendix A contains instructions for charging the "D" batteries. Tables and graphs are included.

PB 30836. JAY, J. H. Qualification tests of low travel limit switches. (AAF Materiel Command Memo Rept ENG-54-656-981B) Apr 1944. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
Results of qualification tests of low travel limit switches, submitted by Micro Switch Corporation, Freeport, Ill., are presented in this report. The switches, in addition to being checked for all detail requirements of the specification, as outlined in appendix I, had two switches subjected to 600 hours at 95 to 100% humidity at + 40 degrees centigrade ± 2 degrees (±104 degrees fahrenheit ± 3.6). At the completion of this test the switches operated an electrical circuit satisfactorily.

PB 28331. MCCARTHY, R. H. and others. Investigation of Nord Deutschecher See Kabel Werke at Nordenham: Ocean cable manufacture, styroflex. (OPB Rept 26) n. d. 4 p. Price: Mimeographed-10¢.
This company is partly owned by Felten and Guilleame and the Siemens-Halske Company. The products manufactured are submarine cable, land cable and styroflex material. Experimental materials are made or compounded at Felten and Guilleame and by I. G. Farben at Berlin. Most material is manufactured by the I. G. Farbed plant at Ludwigshafen. The only processing of material at Nordenham is the addition of coloring matter where required. The company was founded in 1899 and has been responsible for laying many of the world's important cables. This enterprise operated with no specific raw material specifications or control. The cable manufacturer relies on the producer of the raw material to make tests and supply data. The chemical and electrical testing laboratories were old fashioned and little used. Mechanical tests were confined to customers' specifications. Nothing appeared new in any of the mechanical processes, including insulation, extrusion and molding, with the exception of the method of making styroflex sheet, which process is described in this report.

PB 30643. MCGARRITY, JAMES W. Japanese military searchlight and accessories. (AFPAC Engineer Technical and Technological Survey, Jan 26, 1946) Jan 1946. 45 p. Price: Microfilm-$1.00 - Photostat-$3.00

This report is concerned with the technological advancement of Japanese military searchlights and accessories, with respect to research and development, design, procurement, supply and use. Accessories include the electrical power generating plant, the control station, the connecting cables and spare parts. A brief description of the equipment investigated is given. Appendix A presents a list of targets covered in the conduct of this investigation. Appendix B lists the equipment and related operating instructions evacuated to The Engineer Board, Fort Belvoir, Virginia, for detailed technical examination and analysis. Appendix C consists of a tabulation of comparative data on the three models of Japanese searchlight equipment in field use at the close of the war. Appendix D presents reports prepared by Nippon Kogaku Co. and Koito Manufacturing Co. on the manufacture of searchlight reflecting mirrors made of glass and made of metal. Photographs, tables, circuit diagram and diagrams are included.

PB 34017. MATTHEWS, S. A. and others. German fluorescent lamp industry and phosphor chemical manufacture. (BIOS Final Rept 395, Item 22, 31) Nov 1945-Jan 1946. 96 p. Price: Microfilm - $2.00 - Photostat - $7.00
Reports on persons, firms and research institutes are given regarding fluorescent lamps, phosphor manufacture and related subjects. The condition of the plants, location, present development, plant equipment and process were considered. Some information was obtained regarding ultraviolet and infrared phosphors, high-voltage fluorescent tubes, incandescent lamps, tungsten filament etc. Some of the firms were only remotely interested in the subject. One firm, Hauff Aktiengesellschaft, Stuttgart, Feuerbach, was concerned only with photographic film and photographic chemicals. A description of their products and price list is given (in German). Visits were made also to the following: The Kaiser Wilhelm Institute, Heidelberg; Dr. Abrahamsik, Heidelberg (with translation of patent application by I.G. Farbenindustrie, dated about March 29, 1944, entitled "Method of purification of ion exchangers"); Kastumt Rhinger Factory, Stuttgart; Wolfram Lampen Aktiengesellschaft, Augsburg; Linde Factory at Munich; Siemens Schuckert and Siemens Halske Nürnberg; Osram G.m.b.H. at Charlottenburg and Berlin, including drawings and translations of articles on luminescent articles and high pressure mercury discharge lamps; Auergesellschaft Aktiengesellschaft, Berlin, including an article on luminescent powders and sulfide phosphors; Dr. Rosenthal, Berlin; Dr. Koehler and Prof. Arndt, Berlin; Telefunken G.m.b.H., Berlin. Heidel de Haen, Hannover, including several articles on phosphors; P. Beiersdorf & Co., A.G., Hamburg.

PB 30844. MILLS, W. H. Operational test of the type XB-1 test kit for the electronic turbo regulator. (AAF Material Command Memo Rept MCG-54-656-1108) Jul 1944. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
A mock-up of the type B electronic turbo regulator was connected to the type XB-1 test kit, and its functions demonstrated. Various parts of the test kit were inspected and improvements, as listed, discussed. The test kit was used to check out the type B turbo regulator units on the B-24J, B-17G and B-29 airplanes. It was concluded that the test kit accomplishes all the necessary tests for checking out the units of the type B turbo regulator system, and its approval for squadron equipment should result in more complete and satisfactory field maintenance.

PB 22713. SCHMIDT, THEODOR. Das mechanisme des hochstrombockbogens (Vorläufiger bericht). (The mechanism of the high-current electric arc. Preliminary report). n. d. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
This report outlines a spectrographic investigation of an electric arc, using carbon as positive electrode and a wick of carbon, dust and salts as negative electrode. The author outlines the direction into which further research should be carried.

PB 18507. SIEMENS & HALSKE A.G., WERNERWERK F. Fabrikationsvorschriften (Manufacturing instructions) (MIS VII 65c14 7001269) n. d. 192 p. Price: Microfilm - $3.00 - Photostat - $13.00
This is a compilation of manufacturing instructions put out by Siemens and Halske A.G., Wernerwerk F. This folder contains detailed instructions on the manufacturing methods, tests, use of raw materials and tools, employed at this plant.

PB 30835. TEACH, W. H. Electro-tie wing flap actuating unit manufactured by the Electrolux Corporation, Old Greenwich, Conn. (AAF Material Command Memo Rept MCG-54-656-979) Feb 1944. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
Tests run on subject unit to determine soundness of operating principle are covered in this report. The unit is identified on its nameplate as "Flap control 24 V.D.C.", and consists of two 24 V. 1/4 HP motors, a relay box, and a single pole double throw switch. From these tests run as described at the Equipment Laboratory, Material Command, it was found that the basic principle of operation of the electro-tie is sound. Tabulated test data are shown in appendix I.

PB 30843. TOLENTINO, J. S. Position light flasher mechanism. (AAF Material Command Memo Rept MCG-54-656-1098) Jul 1944. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
Two subject items were submitted for test to the Material Command by Wallace & Tiernan Products of Belleville, N. J. The units were subjected to operation tests in the laboratory, and the results are given in appendix I of this report. It was concluded that the flasher mechanisms do not fully meet the requirements: There is no code flashing feature in either unit, and the units failed to operate at cold temperature tests.

PB 34925. U. S. BUREAU OF ORDNANCE. Electrodes, welding, aluminum bronze. (NAVORD Specification 1360) Sep 1943. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report contains Naval Ordnance specifications as to grades, sizes, material and workmanship, and general and detail requirements as to size, hardness, marking, tests, packing and shipping of aluminum bronze welding electrodes.

PB 30349. U. S. ENGINEER BOARD. Searchlights for airborne antiaircraft units. (Rept 746) Apr 1943. 48 p. Price: Microfilm-$1.00 - Photostat-$4.00
This report covers the development, engineering tests and service tests of a searchlight developed for use by airborne anti-aircraft Units. The equipment developed consists of a 60-inch searchlight of seamless steel tubular construction together with a control station and power plant. The complete equipment weighs approximately 2700 pounds and can be carried in the smallest transport cargo airplane or glider, or can be transported over all types of terrain by 6 men. It can also be transported in a standard searchlight trailer or truck. The searchlight was to have the ability to track and illuminate sufficiently to be discerned with the unaided eye, a camouflaged light bombardment airplane travelling at 300 miles an hour, at ranges of from 100 yards to 3000 yards. It must have provision for spread beam to facilitate pick-up, and quick contraction of beam on pick-up, and also ability to slew rapidly to pick up new targets. The searchlight developed had a special lightweight 60-inch mirror, and three motions, azimuth, elevation and tilt. The control station and power plant are described. Photometric data were taken on the searchlight range, and it was found that, as composed with other 60 inch searchlight, this equipment had approximately 10% more light intensity and approximately 60% more lumens in the beam. Extensive tests were made, and while some changes are recommended, it was proved to be extremely rugged and flexible. Many photographs and graphs are included.

PB 18187. WIRTSCHAFTSGRUPPE ELEKTROINDUSTRIE. TECHNISCHE ARBEITSGEMEINSCHAFT DER FACHGRUPPE 8 "DRÄHTE UND KABEL." Niederschrift über die Chemikersitzung am 31.1. 40 (Minutes of the meeting of January 31, 1940 of chemists in 8 "wire and cable" division). (MIS VII 68 A12 7002769) Feb 1940. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
This report contains a transcript of the minutes of a conference held on January 31, 1940 by chemists of the Technische Arbeitsgemeinschaft der Fachgruppe 8 "Drähte und Kabel" (Tafacht), a division of a German nation-wide association of the electrical industry. Among the subjects discussed at the meeting were: Proposed changes in the VDE (Society of German Engineers) regulations regarding production of thermoplastic materials; specifications and characteristics of buna and perbuna rubber; standardization of bitumen and other insulating materials used in the manufacture of cables; proposed specific colors and dimensions for insulating foil, and proposed changes in the section of VDE regulation No. 0285 dealing with tests for cable insulators and casings. In German.

FOOD AND KINDRED PRODUCTS

PB 34807. HOLDERBY, J. M. Waldhof process for production of food yeast. (FIAT Final Rept 619) May 1946. 6 p. Price: Microfilm - $1.00 - Photostat - $1.00
The Waldhof process is perhaps the most outstanding development in the field of yeast production in that it puts yeast growing on a continuous basis and apparently offers a mechanical solution to the problem of foamy substrates. It was first put into operation at Mannheim-Waldhof A.G., and since installed in some six other locations. Neutralization of waste sulphite liquor, yeast growing tanks, defoaming centrifuge, and yeast separation and concentration are discussed in this report. It is concluded that this process was obviously frozen at an early stage of development, and that considerable work remains to be done before its full capabilities are revealed. Appendices list German personnel interviewed, targets visited, and reports transmitted to Washington. For abstracts of reports mentioned see PB 2041, p. 267, PB 7736, p. 511, and PB 18896, p. 1173, all in vol.1 of this Bibliography.

FUELS AND LUBRICANTS

PB 32160. GREAT BRITAIN. MINISTRY OF FUEL AND POWER. Technical report on the Ruhr coalfield, by a mission from the Mechanisation Advisory Committee of the Ministry of Fuel and Power: Volume I. (BIOS Final Rept 394) Feb 1946. 67 p. Price: Microfilm-$2.00 - Photostat-$5.00
This report examines developments in coal mining technique in the Ruhr coalfield under the following topics: (1) Coal face equipment and power loading devices for longwall faces and coal face lighting; (2) the system of driving roadways into stone; (3) underground transport, with special reference to locomotive haulage; (4) winding and shaft layout, with special reference to Koepe winding; and (5) surface arrangements. Fourteen mines were visited and nine underground inspections were made. Equipment and methods are described in some detail, and there are a number of tables. Two later volumes are to be published, containing drawing, appendices and reports of various investigating teams of specialists.

PB 32578. HOLLINGS, H. and others. Lurgi high pressure gasification. (BIOS Final Rept 521, Item 30) n. d. 75 p. Price: Microfilm-$2.00 - Photostat-$5.00
The Lurgi Gesellschaft für Wärmetechnik had developed a process for the gasification of coal with steam and oxygen under pressure to produce directly gas suitable either for municipal supply or synthetic processes. This report reviews the published literature on the subject and describes the plant and its operation. The carbonization and gasification are described in detail. Flow sheets of the process are given . In general, it was found that lean hard coal could be gasified under pressure satisfactorily while gas flame coals usually required pre-treatement to reduce the caking properties. It is seen that the proportion of methane formed on gasification increases with increasing pressure and decreases with increasing temperature. Also that by gasification at a pressure of 20 atmospheres it is ideally possible to produce a gas with a calorific value of about 8000 k. cals. per normal cubic meter, (at 0° C and 760 mm). In actual practice, the theoretical value is not obtained. However, the more reactive the fuel gasified, the nearer does the gas approach the ideal. A table shows the difference in behavior between brown coal and hard coal. Tables show the operating conditions, gas analyses, and costs. Photographs, diagrams of the major equipment, tables, and graphs illustrate the different phases of the gasification study. The operation of the A. G. Sachsische Werke at Böhlen (near Leipzig) is described in considerable detail, and in lesser degree so is the experiment to produce synthesis gas from hard coal from the Karsten-Zentrum mine, Upper Silesia, as carried out at the Hirschfelde works of the A. G. Sächsische Werke. Also included are documents taken from Böhlen and Frankfurt.

PB 20009. I. G. FARBENINDUSTRIE. Angebot auf eine anlage mit einer jahresproduktion von 100,000 kiloliter fliegerbenzin und 24,000 t flüssiggase aus Fupin-kohle durch katalytische druckhydrierung für die Kaiserliche Japanische Armee (Cost outlay for a plant producing annually 100,000 kilolitres of aviation gasoline and 24,000 tons of liquid gasses by catalytic pressure hydrogenation of Fupin-coal, submitted to the Imperial Japanese Army). Mar 1944. 86 p. Price: Microfilm-$1.00 - Photostat-$4.00
Detailed technical description of the hydrogenation equipment and the various steps of operation performed with same. Four diagrams are attached. The Japanese text written on stationary of the Mitsubishi Shoji Kaisha G.m.b.H., the agent for the Japanese army, consists (1) of a report on the same subject; (2) of a full translation of the German text. In German and Japanese.

The eleven documents abstracted below are enclosures to and supplement PB 22713 abstracted in this Bibliography Vol. 2, page 28.

PB 22697. MORSCHEL and SCHULTE. Polymerisation des tetrahydrofurans (Polymerisation of tetrahydrofuran) (Enclosure (A to PB 22713, "The preparation of tetrahydrofuran polymers as a synthetic lubricant for metals") Oct 1940. 17 p. Price: Microfilm - 50¢ - Photostat - $2.00
This report is divided into three parts. In the theoretical part A the eight most important catalysts, the mechanism of reaction, the constitution, degree of polymerization, physical and chemical properties and mixed polymerization are discussed. In the experimental part B special procedures are described for the production of the various polymers: (a) starting material (b) polymerization procedure (c) products with high viscosity (d) product with intermediate viscosity (e) product with low viscosity (f) equipment (g) reactions. In part C tetrahydrofuran polymers are tested for various fields of application: (1) Product M for the army (purpose not specified) (2) as agent to render Buna S sprayable (3) for greasing leather (4) as textile aids (5) as lubricants (6) for the lacquer and plastics industry. In German.

PB 22700. DELFS. Über die polymerisation des tetrahydrofurans (The polymerization of tetrahydrofuran) (Enclosures (B) to PB 22713, "The preparation of tetrahydrofuran polymers as a synthetic lubricant for metals") Oct 1941. 22 p. Price: Microfilm - 50¢ - Photostat - $2.00
After discussing the theory of the polymerization of tetrahydrofuran a description of the polymerization technique is given. Formation of oxonium salts of tetrahydrofuran is achieved by addition of (1) a hydrogen atom to tetrahydrofuran (2) an alkyl-cation (3) an acyl group. Then a description of the polymerization itself is given. Another section is devoted to the study of side reactions which occur when polymerization of tetrahydrofuran is performed at higher temperatures. Other topics are: Mixed polymerization of tetrahydrofuran with other cyclic ethers, isolation and constitution of the polymers, properties of the polymers and mixed polymers of tetrahydrofuran, and application of the tetrahydrofuran polymers. In German. In German.

PB 22698. MORSCHEL. Polymerisation des tetrahydrofurans; (Polymerization of tetrahydrofuran) Stand d. fabrikation am 17.7. 1942 (Enclosure (C) to PB 22713, "The preparation of tetrahydrofuran polymers as a synthetic lubricant for metals") Jul 1942. 5 p. Price: Microfilm - 50¢ - Photostat - $1.00
This report dated July 17, 1942 gives details on the production of two different types of lubricants: M586, a high temperature steam oil and M620, an automobile oil and gear lubricant. Section A (polymerization) deals with (1) the water content of tetrahydrofuran (2) the speed of distillation of ethylene oxide (3) the mixing ratio between tetrahydrofuran and ethylenoxide which is 5:1 for M586 and 1:1 for M620 and (4) the catalyst used, consisting of ferric chloride and chloro methylether or thionyl chloride. In section B (further treatment of the raw oils) special instructions are given as to (1) extraction with bisulfate solution (2)neutralization (3) development of halogen-free oils with the help of alcoholates (4) filtration and (5) stabilization. In German.

PB 22699. SCHULTE. Ester polymerer butylenglykole (Esters of polymeric butylene glycols) (Enclosure (D) to PB 22713, "The preparation of tetrahydrofuran polymers as a synthetic lubricant for metals") Sep 1943. 7 p. Price: Microfilm - 50¢ - Photostat - $1.00
This study reports on experiments to obtain (1) diacetates by polymerization of tetrahydrofuran with acetates by polymerization of tetrahydrofuran with acetic anhydride and perchloric acid (2) glycols by saponification with methanol, water or stream, and alkali and reaction of the diacetate with adipic - and perchloric acid and (3) esters of polymeric butylene glycols, using isocaproic acid alone and in combination with succinic or adipic acid. In German.

PB 22701. MORSCHEL. Estergruppen-haltige tetrahydrofuranpolymerisate, motoremöl Le 1(Tetrahydrofuran polymers which contain ester groups) (Enclosure (E) to PB 22713, "The preparation of tetrahydrofuran polymers as a synthetic lubricant for metals") Sep 1943. 7 p. Price: Microfilm - 50¢ - Photostat - $1.00
This is a continuation of experiments to obtain oil-like mixed polymers of tetrahydrofuran with a better solidifying point (see PB 22702 below). These chlorine-free polymers can generally be classified as (1) ester oils with two terminal ester groups (2) ester oils with more than two terminal ester groups. The various methods of polymerization, the catalysts used, the characteristic terminal groups, and the testing results are shown in detailed tables.

PB 22703. MORSCHEL. Bremsflüssigkeit für rohrücklaufbremsen. (3),(Recoil fluid for the recoil mechanism of guns) (Enclosure (F) to PB 22713, "The preparation of tetrahydrofuran polymers as a synthetic lubricant for metals") Jan 1943. 2 p. Price: Microfilm - 50¢ - Photostat - $1.00
This is a short report on tests on behalf of the German army for the development of a recoil fluid. The new liquid should meet the following requirements: Viscosity about 200 C st. at - 50°C, resistance to cold up to -70°C, sp. gr. not below 1.10 at + 20°C. The final product offered had the following composition: "Sulfoethane" 38.0%, methane amide" 4.0%, methyl glycol 40.0% methyl diglycol 19.8%, and anti-scidant "no. 4010" 0.2%. In German.

PB 22706. MORSCHEL. Polymerisation des tetrahydrofurans; Stand d. fabrikation 2, (Polymerization of tetrahydrofuran) (Enclosure (G) to PB 22713, "The preparation of tetrahydrofuran polymers as a synthetic lubricant for metals") Jan 1943. 3 p. Price: Microfilm - 50¢ - Photostat - $1.00

This report dated Jan 12, 1943 continues the description of methods for production of the two tetrahydrofuran lubricants M586 and M620 (see PB 22698). The following mixture was used for the preparation of the catalyst: 12 l. of tetrahydrofuran, 4 Kg. of ferric chloride, and 3 Kg. of thionyl chloride. The polymerization mixture for M586 consisted of 100 parts of tetrahydrofuran, 25 parts of ethylene oxide, 3 parts of thionylchloride, and 0.3 parts of ferric chloride. The polymerization mixture for M620 consisted of 100 parts of tetrahydrofuran, 75 parts of ethylene oxide, 6 parts of thionylchloride, and 0.3 parts of ferric chloride. The polymerization was performed at a temperature of 28-30°C. There are also improvements in the instructions for the further treatment of the raw oil. In German.

PB 22702. MORSCHEL. Polymerisation des tetrahydrofurans; eigenschaften von chlorfreien, öligen polymerisaten (Polymerization of tetrahydrofuran; properties of chlorine-free oil-like polymers) (Enclosure (H) to PB 22713, "The preparation of tetrahydrofuran polymers as a synthetic lubricant for metals") Jan 1943. 4 p. Price: Microfilm - 50¢ - Photostat - $1.00

Object of this study was the development of a high-grade motor oil. A mixed polymer of tetrahydrofuran, ethylene oxide, thionylchloride and ferric chloride was prepared, giving a chlorine containing oil. After this polymer was submitted to reaction with various alcohols and caustic soda to remove chlorine, solidifying points and viscosities were determined. Other tests were made to improve the cold behavior of the end products by increasing the ethylene oxide portion. Oil-like mixed polymers with a better solidifying point were obtained if propylene oxide was used instead of ethylene oxide. In German.

PB 22706. MORSCHEL. Polymerisation des tetrahydrofurans; Stand der fabrikation, 3 Polymerization of tetrahydrofuran) (Enclosure (I) to PB 22713, "The preparation of tetrahydrofuran polymers as a synthetic lubricant for metals") Dec 1943. 2 p. Price: Microfilm - 50¢ - Photostat - $1.00

This is the third report on production methods for the two tetrahydrofuran lubricants M586 and M620 (see PB 22698 and 22706), dated Dec 31, 1943. The polymerization mixture for M620 was changed as follows: Tetrahydrofuran 100 parts, ethylene oxide 50 parts, thionylchloride 6 parts, ferric chloride 0.3 parts. There are also slight changes in the instructions for the further treatment of the raw oil. In German.

PB 22704. SCHULTE. Über die darstellung polymerer glykole (The preparation of polymeric glycols) (Enclosure (J) to PB 22713, "The preparation of tetrahydrofuran polymers as a synthetic lubricant for metals") Jan 1944. 3 p. Price: Microfilm - 50¢ - Photostat - $1.00

This report describes experiments to obtain low polymeric glycols by the reaction of 1,4-dichloro butane with an excess of 1,4- butanediol and aqueous sodium hydroxide. After heating the dichlorobutane and the diol to 90°C, 40% sodium hydroxide is slowly added under 300-400 mm vacuum. After the end of the reaction (3-4 hrs.) the excess alkali is neutralized. The glycol is separated from the salt solution and the aqueous layer subsequently extracted, three times with tetrahydrofuran. The reaction with dichlorodibutyl ether is similar. The physical properties of some of the esters are presented in a table. In German.

PB 22716. I. G. FARBENINDUSTRIE. Physical properties of tetrahydrofuran polymer (Physical properties of tetrahydrofuran lubricants) (Experiments 2555, 3241, 3484, 5202) (Enclosure (K) to PB 22713, "The preparation of tetrahydrofuran polymers as a synthetic lubricant for metals") 1943-1944. 4 p. Price: Microfilm - 50¢ - Photostat - $1.00

This folder contains four test sheets listing specific gravity, solidification point, pour point, viscosity, etc. of two motor oils and gear lubricants, one bearing oil, and one polyglycol ester. In German.

PB 19449. PETRASCHECK. Braunkohlenforschungen (Brown coal research). (Reichsforschungsrat). (ALSOS Mission RFR 507 29) Dec 1944. 2 p. Price: Microfilm-50¢ - Photostat-$1.00

This half-yearly administrative progress report on brown coal research at the "Institut für Geologie und Lagerstättenlehre" in Leoben (Styria) tells of interruptions to current research projects due to air raids. Progress is reported with an experiment confirming earlier studies on the softening process which wood undergoes during its transformation into coal. No pertinent scientific information is presented.

PB 19380. RUNGE. Entwicklung verbesserter verfahren zur reinigung der dickspülung von bohrschmand (Improved method for purifying drilling mud). (Reichsforschungsrat). (ALSOS Mission, RFR 506 24). Dec 1944. 1 p. Price: Microfilm-50¢ - Photostat-$1.00

A short progress report on investigations concerning drilling mud is presented. The tests undertaken (viscosity, thixotropy, particle size) are outlined. The results obtained so far are unreliable, due to lack of uncontaminated samples.

PB 19379. RUNGE. Nutzbarmachung des in durch tiefbohrungen ausgebeuteten erdöllagerstätten verbliebenen erdöl durch bergmannische gewinnungsverfahren(Application of mining methods to the production of petroleum from areas where drilling was formerly employed) (Reichsforschungsrat) (ALSOS Mission, RFR 506 25) Dec 1944. 2 p. Price: Microfilm - 50¢ - Photostat - $1.00

An investigation of the oil resources of Carpathia, the Moravian Alps, and the Danube region was instigated. Employment of conventional drilling methods and of a new washing or spraying technic developed at Sokolnitz near Brünn was to be considered. This report is a brief statement on preliminary agreements between the owners of the oil fields, and the investigating agency regarding core samples from the Satschan wells near Brünn, and the wells at Leoprechting on the Upper Danube. Samples of asphalt lime from Rhingen on the Danube, and of asphalt sands from nearby Herbertshofen were also obtained. No further details are given. In German.

PB 19400. SCHNEIDER. Ölmessung und gas-öl-verhältnis (Measurement of oil and gas-oil ratios). (Reichsforschungsrat). (ALSOS Mission, RFR 506 3). Dec 1944. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a brief administrative report on a research project pertaining to the measurement of oil flow and to gas/oil ratio questions. No pertinent scientific information is presented. In German.

PB 36068. U. S. BUREAU OF ORDNANCE. Hydraulic gear oil (type 150). (NAVORD Specification 1015) Feb 1937. 1 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report gives specifications established by the U. S. Naval Gun Factory as to the chemical and physical characteristics, sample to be submitted, and packing and marking of Type 150 hydraulic gear oil to be purchased by Naval Ordnance.

PB 34035. WALLER, C. J. and MURRAY, C. A., JR. Gesellschaft für Teerverwertung m.b.H., Duisburg-Meiderich & Castrop-Rauxel. (BIOS Final Rept 480, Item 30) May 1946. 63 p. Price: Microfilm-$2.00 - Photostat-$5.00
This firm's Duisburg-Meiderich and Castrop-Rauxel plants were visited for information regarding their processing of coal tar. The report describes the storage and dehydration of the crude tar, tar distillation and working up of the light, middle and heavy oils. The extraction and working up of the tar acids and the settling and production of naphthalene and anthracene are also considered. The report gives the general scheme for the batch tar distillation and the continuous vacuum tar distillation at Duisburg. Photographs, diagrams and graphs are included in the report. The appendix also includes an article on the "Continuous Distillation of Coal Tar" (in German) by W. Fischer, Chief Engineer at Duisburg.

HIGHWAYS AND BRIDGES

PB 36113. U. S. WAR DEPARTMENT. Steel-treadway bridge M2. (Tech Manual 5-272) May 1944. 72 p. Available from the Supt of Docs., Washington 25, D. C., 15¢
This manual describes the construction of steel-treadway bridge M-2, a type of bridge which can be built of either floating or fixed spans, or a combination of both, and which is used to provide a rapid means of stream crossing for medium tanks and other vehicles. The subjects dealt with include the following: Description and use of equipment; transportation; selection and preparation of bridge sites; working party; construction; rafts; and traffic control and maintenance of bridge. Numerous photographs, drawings, tables and diagrams illustrate the text.

PB 36212. U. S. WAR DEPARTMENT. Stock-pile railway and highway bridges: Part 1. Railway bridges; Part 2. Highway bridges. (Tech Bulletin ENG 12) Mar 1944. 111 p. Price: Microfilm-$3.00 - Photostat-$8.00
This bulletin indicates the general characteristics and availability of the various types of Class IV bridging equipment for highway bridges procured in the United States for use in all theaters of operation during the war just past. The quantities shown represent the total amount of equipment and material available to all theaters. Brief descriptions of the bridges state the general purposes for which they are used, their capabilities, design loads, dead weights, and shipping tonnages. Illustrations and statistical tables complete the report.

PB 31670. VAUGHAN, J. D. and FLEMING, W. A. Institut für Bauforschung und Materialprufungen des Bauwesens, Stuttgart-Ost: Testing laboratory attached to the Technische Hochschule. (BIOS Evaluation Rept 387) Feb 1946. 1 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report contains a brief resume' of intelligence obtained through interviews with key personnel at the testing laboratory attached to the Technische Hochschule, Stuttgart, in regard to work done there on welded bridges, internal stress calculations for suspension and timber plate girder bridges, interval stresses set up by welding, fatigue tests, etc. Details are lacking.

INSTRUMENTS (PROFESSIONAL, SCIENTIFIC AND CONTROLLING)

PB 30528. ARELL, R. F. Static test of direct current strain gage torquemeter. (AAF ATSC Eng Div Memo Rept TSEPL-5-5-3-3067) Feb 1945. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
The results of a static test of a direct current strain gage torquemeter as conducted on the nose section of an R-3350 engine are reported. The sensitivity of the D. C. strain gage circuit as installed and tested on the R-3350 propeller reduction gear was insufficient to be of practical value as a flight instrument for indicating engine torque.

PB 28738. RAHLES, J. W. and GARDNER, G. H. W. Anschutz & Co., Kiel. (CIOS File XXV-39, Items 1, 2, 12, 27) Jun 1945. 10 p. Price: Microfilm - $1.00 - Photostat - $1.00

The firm of Anschutz and Co., Kiel was visited. This firm made gyros, gyro compasses, gyro bearings, potentiometers, artificial horizons, liquid switches and small D.C. motors. Very little information on these items is contained in this report.

PB 30229. BRUMSELLER, CARL E. Portable micrometeorological anemometers and thermometers. Oct 1945. 93 p. Price: Microfilm-$2.00 - Photostat-$7.00
In the study of the transmission of ultrasonic sound in air outdoors, certain phenomena suggested the need of sensitive micrometeorological equipment to obtain needed facts about the transmission medium. This report concerns the main part of such equipment consisting of four microanemometers and four microthermometers. They are all direct reading and respond to rather rapid fluctuations in wind and temperature. These instruments also can be coupled in pairs to measure instantaneous temperature differences and wind differences directly. Their construction and operating characteristics are described, as well as discussed critically. Typical data taken with this equipment are also included in this report as evidence that it has actually been used in the field as well as to illustrate what can be done with it. Diagrams, photographs and graphs are included. A bibliography covering work done in micrometeorology in Germany 1876-1930 is included. This is a Master's Thesis from Pennsylvania State College.

PB 28524. GARVIN, J. S. Design and production of amplifier calibrators. Final report. (OSRD Rept 6163) Dec 1945. 25 p. Price: Microfilm-$1.00 - Photostat-$2.00
The amplifier calibrator in conjunction with a strain (pressure) gauge, a Wheatstone Bridge circuit and an oscillograph is used to determine the thrust exerted by the firing of a rocket and/or to measure the gas pressure in the rocket motor. The function of the amplifier calibrator unit is to calibrate automatically each oscillograph pressure record is taken. Three designs and their operation are described. Photographs and diagrams of these designs are included as well as bibliography. This is a final report of the Bell Telephone Laboratories for the Western Electric Company.

PB 31009. GREGG, E. C., JR. Thermocouple wattmeters using unmatched thermocouples. (OSRD Rept 3215; NDRC Rept 6.1-1360) Jan 1944. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
In this memorandum from the Underwater Sound Reference Laboratories, Division of War Research, Columbia University, the theory of the thermocouple wattmeter is extended to cover couples (1) that do not have the same heater resistance, and (2) that differ in their AC constants and heater resistances. A method of allowing for these differences in the design is given. A wattmeter of type (1) has been constructed, and is described. A schematic diagram is included.

PB 34827. HICKS, E. F. Calibration of service tire gages. (AAF AMC Eng Div Memo Rept TSEPE-657-1048) Jul 1946. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The purpose of the tests reported here was to determine the accuracy of standard tire gages now in service. Procedures and results are described in appendices I and II. It is concluded that the tire gages now in use are not sufficiently accurate for maintenance purposes under normal use; and that, inasmuch as the tire gages become inaccurate during normal use, a thirty-day periodic inspection should be made on all tire gages in service, and before they are issued to using activities. Graphs are included.

PB 19602. HOFMANN, P. Methode der mikroskopischen darstellung der zu zahlenden staubteilchen (Method of making dust particles visible to be counted) (ALSOS Mission, RFR 505 10) Nov 1944. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Short report on experiments for the measurement of clay dust using combined dark- and bright-field observations. A device to be used in connection with the recording konimeter was developed and tested. In German.

PB 20003. JAPAN. ARMY ORDNANCE INSPECTOR'S OFFICE IN ITALY. Description of Italian precision measuring instruments. (Italian. Technical Investigation 306) n.d. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a short description of various inspection instruments such as dimension control instruments, surface inspectometers, clinometers, etc. manufactured by the Italian firm Galileo. In Japanese.

PB 34784. MACDONALD, J. K. L. and SCHAAF, S. A. On the estimation of perturbations due to flow around blast gauges. (New York Univ Applied Math Group Rept 136; NDRC Applied Math Panel Note 22; OSRD Rept 5639) Sep 1945. 14 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report was prepared for members of the gun blast committee (NDRC) and others concerned with gages for measuring transient pressures. A shock tube developed at Princeton University furnishes a method for the calibration of tourmaline gages and other gages for measuring pressure under dynamic conditions resembling those in air blasts from bombs and guns. Some anomalies in the calibrations have been observed and have been attributed to the deflection of the air flow around the gages. The report presents the results of a theoretical investigation on the magnitude of such effects and offers criteria for choosing sizes and shapes of baffles (and of shock tubes) to reduce perturbations to negligible proportions.

PB 34923. U. S. BUREAU OF ORDNANCE. Light well Mark 7 & Mk, 7 mod. 1. (NAVORD Specification 1006) Nov 1942. 3 p. Price: Microfilm - $1.00 - Photostat - $1.00
Light wells covered by these specifications will be used for the illumination of dials and scales in fire control instruments. The purpose of the light well is to provide a watertight housing for the lamps, arranged so that lamp bulbs may be changed without disturbing the watertightness of the instrument to which it is attached. Material and construction of these light wells are specified in detail.

PB 36017. U. S. BUREAU OF ORDNANCE. Machines, universal drafting (for ordnance purposes). (NAVORD Specification 610) Apr 1932. 2 p. Price: Microfilm-$1.00 Photostat-$1.00
The machine shall be so designed and constructed that when anchored at the upper left-hand corner of a chart board, the operator shall be able to transfer, in one motion, from any part to any other part of a chart or drawing, two lines at different angles to each other and at any angle to the side of the board so that these lines, when transferred, will remain parallel to their original direction. Detailed requirements are specified.

PB 31698. U. S. NAVAL ORDNANCE LABORATORY. Installation of instruments in jetted pipe. (Mine Unit Rept 247) Jun 1941. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
The purpose of this report is to describe the manner in which pipe-position is indicated to a diver mounting instruments on a jetted range when visibility is poor. Three methods of indicating pipe position in jetted pipe ranges when visibility is poor, and ways of inserting instruments in these pipes are briefly described. The report is concluded with a procedure for securing and weighting cable leads to prevent failure resulting from their otherwise excessive motion along the bottom due to tides.

PB 31707. U. S. NAVAL ORDNANCE LABORATORY. Study of tilt and displacement of a cylindrical body suspended by a flexible cable in uniformly moving water. (Mine Unit Rept 351) Oct 1941. 47 p. Price: Microfilm-$1.00 - Photostat-$4.00
The purpose of this report is to present a theoretical analysis and experimental tests of the tilt and displacement of a portable marine magnetometer detector in each of several types of cases. An analytical procedure is presented for the computation of: (1) The tilt; (2) the downstream displacement of a cylindrical case; and (3) the ballast weight required to reduce the tilt or downstream to a specified amount. Experiments are described and measurements given that support the analytical predictions. Recommendations for improved cases, methods of mounting the detector unit, and for simplified supporting cable are then made. Tables, drawings, and graphs are included.

PB 36694. U. S. WAR DEPARTMENT. Ordnance maintenance: Wrist watches, pocket watches, stop watches, and clocks. (Tech Manual 9-1575) Apr 1945. 227 p. Price: Microfilm-$5.00 - Photostat-$16.00
This is a manual published for the information and guidance of ordnance maintenance personnel. It contains detailed instructions for inspection, disassembly, assembly, maintenance,and repair of military timepiece issued to the using arms. This manual does not contain information which is intended for the using arms, since such information is available to ordnance maintenance personnel in TM 9-575 (PB 3230, abstracted in v.1, p. 385). It contains a brief description of watch construction applicable to all ordnance timepieces. It also contains explanation of functioning, and factors which affect functioning of timepieces. The manual is illustrated throughout with photographs and drawings.

PB 28886. WALKER, G. H. Fried. Krupp, Germaniawerft, Kiel. Water brake dynamometers. (BIOS Final Rept 508, Item 31) May 1946. 18 p. Price: Microfilm-$1.00 - Photostat-$2.00
The investigation reported herein was instituted by the British Admiralty to determine whether advances had been made in the manufacture of dynamometers, which were unknown to them. The target was Krupp, Germaniawerft, Kiel. A list of orders for dynamometers to be supplied by Krupp is appended to this report. The total number ordered during a ten year period amounted to 823. Approximately 88% of these consisted of Type A single rotor non-reversible dynamometers of small to medium size fitted with sluice gear for controlling load and speed. On the whole the equipment studied conformed to standard designs. Tables appended to the report give the characteristics of all the models of Krupp's "Froude" type water brake dynamometers. Drawings are included.

LEATHER AND LEATHER PRODUCTS

PB 36787. U. S. CLIMATIC RESEARCH LABORATORY, LAWRENCE, MASS. Footgear, traction: Appraisal of fifteen types of footgear and accessories on varied appropriate terrain. (Report No. CRL-278) Nov 1944. 44 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report is a comprehensive study of the traction provided by a number of issue boots and shoes on many types of terrain. The test was devised originally as a study of traction and intimately related aspects. Shortly after initiation, however, it was apparent that the action of the foot in the boot as well as the vagaries of terrain demanded consideration. In these latter categories descriptive rather than quantitative data were evolved. It is recommended that: (1) In view of the fact that the Tricouni nails gave the best traction per se, and the rubber cleated sole was the most desirable for many purposes, consideration should be given to making a sole that combines the best features of both; (2) since only one type of nail and one design of rubber cleat was available for test, modification of these standard designs should be explored; and (3) consideration should be given to condemning the use of a plain leather sole for any boot that requires traction in use. Appendices present list of agenda and experimental data. Photographs and tables are included.

PB 36208. WILLIAMS, GORDON C. Animal tendons, substitute soles for leather. Final report, May - Oct, 1945. Sep 1945. 48 p. Price: Microfilm-$1.00 - Photostat-$4.00
This report is a final summary, on a comparative basis, of all data on the study of the use of animal tendons as a substitute for sole leather which constituted Project No. 7 at the University of Louisville Institute for Industrial Research. It includes outlines of experimental procedure and correlated results, a survey of the financial possibilities for the product, and a bibliography. It was concluded that such fibers have a number of characteristics similar to those of leather in a shredded form, but are much more uniform in nature. Two binding agents have been found for forming the fiber into sheets suitable for shoe sole material. These are plasticized Chrysler Cycle-Weld Cement and Monsanto polyvinyl Butyral. The procedure is however of small economic importance, as a maximum of only 0.3% of yearly hide weights could be produced. Utilization would be restricted to specialties of higher weight/cost ratio, such as gaskets.

LUMBER AND WOOD PRODUCTS

PB 34853. BEARDSLEY, G. F. Aircraft veneer plywood, laminated wood and adhesives. (AAF T-2 Air Tech Intelligence Review F-IR-84-RE) Jul 1946. 5 p. Limited supply of mimeographed copies available for 25¢; thereafter, Microfilm-$1.00 - Photostat-$1.00
This report is based on an interview of Mr. S. Hirayama who, from November 1943 until the end of the war, was responsible for all basic research in veneer plywoods, laminated woods and adhesives at the First Naval Air Technical Arsenal, Yokosuka. It covers briefly the various veneer plywoods, laminated woods and adhesives in use by the Japanese Navy during the latter part of the war, as well as the results of recent Yokosuka experiments in the use of vegetable and blood proteins and viscose compounds as adhesives. Sources of more detailed information on material specifications, physical properties and design criteria are given.

PB 36752. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, IND. Evaluation of the effect on durability of visible defects in the handle end of softball bats. (Rept 183) Jun 1945. 14 p. Price: Microfilm-$1.00 - Photostat-$1.00
Selected softball bats were tested to determine the durability of bats with obvious defects in the handles as compared with bats without apparent defects. It is concluded that the critical breakage zone for softball bats is found between six and fourteen inches from the knob end, and imperfections appearing in this area significantly decrease the durability of the bat; breakages in bats without visible defects in the handle occur generally in those with lower specific gravity; breakages produced by the impact test apparatus occur in the same general areas of the bat as those fractures resulting from normal play. A table shows the weights, specific gravity and diameters of all softball bats included in the test. Appendix presents detailed results of impact tests and photographs.

PB 36764. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, INDIANA. Water absorption characteristics of laminate, plastic, protective. (Rept 134) Mar 1945. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
During preliminary discussion concerning a proposed revision of O.Q.M.C. specification 181, laminate, plastic, protective, a suggestion was made for the inclusion of water absorption test in the revised edition. Since little or no data were available on this characteristic of the laminate, this laboratory was directed to conduct this test on several samples. Test procedure and results are presented. It is concluded that water absorption of laminate, plastic, protective, based on samples examined in this report, is approximately 1.0 to 1.5 percent; material lost during soaking was very small, of the order of 0.1 to 0.2 percent, and could easily be accounted for in specification tolerances, although in the case of boards improperly laminated this value would probably be high and would thereby attain importance; laminate produced by contractors no. 3 and no. 4 exhibited water absorption values considerably below those shown by contractors no. 1 and no. 2; and it is suggested that the proposed water absorption test place a maximum of 2.0 percent for water absorption and a maximum of 0.3 percent for soluble material lost, when conducted according to federal specification. Appendix consists of tables showing individual values secured during water absorption tests on laminate, plastic, protective.

PB 31590. WINSLOW, C. P. and others. Resin filled fiberboard of the Holig Homogenhols-Werke. (FIAT Final Rept 572) Dec 1945. 17 p. Price: Microfilm-$1.00 - Photostat-$2.00
This is a report of production processes and planned output at the new Baiersbronn (Germany) plant of the Holig Homogenhols-Werke, a Swiss-owned concern producing "homogeneous" wood, a resin-filled fiberboard. An appendix contains references to other reports on the same subject, titles of supplementary documents deposited in the Forest Products Laboratory, Madison Wisconsin, and extensive notes on the properties of homogeneous wood, besides a page of diagrams of the machinery and apparatus used in the initial defibrating process.

MACHINERY (EXCEPT ELECTRICAL)

PB 33312. BRITISH INTELLIGENCE OBJECTIVE SUB-COMMITTEE. Preliminary reports list no. 328. Aug 1945 - May 1946. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
Summaries of BIOS interim reports nos. 5343 to 5353 inclusive on German industry present in tabular form, name of each factory visited, location, condition, and principal products, as follows: Maschinenfabrik A. Beien, Herne, (slightly damaged, manufacture mining stowage machines); Karl Brierden & Co., Bochum Linden, (main factory destroyed, mining machinery); Westfalen Colliery, No. 3 (operating, mining machinery); Westfalia Lünen Werke, Bochum, (operating, mining stowage machines); Frölich & Klupfell, Wuppertal-Barmen, (in production, mining stowage machines); Becorit-Grubenausbau G.m.b.H., Recklinghausen, (damaged, manufacture pit props); Gebrüder Kumpmann, Ludenscheid, (undamaged, manufacture of screws); Westfalische Drahtindustrie, Hamm, (very badly damaged, manufacture of screws); Ludwig Grefe, Ludenscheid, (slight damaged, machinery for production of wire and screws); Siemens & Halske, Gartenfeld, (cables and wire); and Gunstahlwerke, Gelsenkirchen, (undamaged, production of machine tools).

PB 36813. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list No. 385. Apr-Jun 1946. 14 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a condensation of B.I.O.S. reports Nos. 5962 - 5974 regarding certain steel works and machine plants visited in Germany. The name of each plant, its location, condition and period to start production were given, date of investigation, and brief summary of final report data regarding products and equipment, are listed. Following are the names of plants and locations, with products and special features, if any, in parentheses: Eisen Hüttenwerke, Bochum (steel rolling); August Bilstein, Altenworde (foundry); Concordia G.m.b.H., Haseln (chilled grain rolls; brick making machinery; rubber and linoleum rolling); Mayer Kalker Tieur Fabrik, Heumar Köln (perforating machines); Messrs. Hickman, Wupperthal, Barmen (perforating machines); Demag. Baggerfabrik, Düsseldorf, Benrath (manufacture of excavating machinery by arc welding); I. Dachs, Porta nr. Minden (dewaxing plant); Groove & Welter, A.G., Heusse A/Rhein (grinding machinery); Edeluamu G.m.b.H., Offices at Berlin - Laboratory & pilot plant at Tempelhof (mechanical seals); Jacob Wikschtrom G.m.b.H., Düsseldorf (nail machines); John Kleinewerfer Söhne, Krefeld (embossing machines); Dornbush & Co., Krefeld (embossing machines); K.S.G. Kohlenscheidungs-Gesellschaft, Berlin-Tempelhof (boilers); Anker-Werke A.G., Bielefeld (accounting machines & cash registers).

PB 36846. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary report list No. 390. May 1946. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
BIOS interim reports Nos. 6034 - 6034, inclusive, listed here, give the names, locations and chief interest of the following eleven German manufacturing plants: (1) Ludwig Grefe, Ludenscheid (manufacture of flow meters); (2) Karlholl, Langenfeld bei Köln (manufacture of collapsible tubes); (3) Walter Theil, Hilgen (weaving machinery); (4) Carl Hertmanni, Remscheid (weaving machinery); (5) A. Kayser, Minbeck (weaving machinery); (6) Fvang Hollenback, Duderstadt (rag-pulling and carding plant); (7) Eberwien Tuch-fabrik, Weende near Göttingen (weaving machinery); (8) Vorsteher & Bunger, Wuppertal Oberbarinen (braiding plant); (9) Emil Stutznacher, Köln-Braunsfeld (quilting machines); (10) Wolfsburg Motor Works, Wolfsburg near Fallesleben (cars); (11) Waldrich Machine Tool Works, Siegen (machine tools).

PB 18271. GERDTS, GUSTAV F. Neuer kondenswasserableiter ohne bewegte teile (New steam trap without moving parts). (MIS VII 68 a 10 7000031) n. d. 1 p.
Price: Microfilm-50¢ - Photostat-$1.00
A brief description is given of a new type of steam trap manufactured by Gustav F. Gerdts, Bremen. The device operates automatically by means of a series of Laval jets which block the passage of steam and adjust themselves to variations in the amount of condensate and pressure. In German.

PB 31939. HAAS, P. W., JR. Report of test of enemy Diesel fuel injectors. (Naval Eng Expt Station Test C-2823) Dec 1945. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
A number of critical parts from a German made American Bosch Diesel engine fuel injector were examined and compared with similar parts from an American injector. The results of the spectroscopic analysis and hardness measurements made on the cam follower, cam follower pin, tappet adjusting screw, plunger, plunger spring and barrel, delivery valve, camshaft, housing and coupling are reported here. In general, the American parts are considered to be equal or superior to the German parts. However, the plastic coupling of German make is believed to be better than the American coupling. Photographs of the complete assembly and the individual parts are included.

PB 20005. JAPAN. ARMY ORDNANCE INSPECTOR'S OFFICE IN GERMANY. Setting up of mass production lines. (German Technical Investigation 215) Nov 1944. 30 p.
Price: Microfilm-50¢ - Photostat-$2.00
The Japanese text is a full translation of the German paper "Fliessefertigung auf Maschinenstrasse" by K. M. Dolezalek, published in "Das Industrieblatt", No. 15/16, August 1944. In Japanese.

PB 33137. KENNEDY, E. D. and HAHN, E. A. Kit, tools, valve stem repair. (AAF AMC Eng Div Memo Rept TSEPE-687-277) Jul 1946. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00
It was concluded that the component parts of the subject kit are satisfactory for the purpose intended, which is to provide the necessary tools for replacing and repairing damaged valve stems in tire inner tubes on aircraft and ground equipment maintained by the Army Air Forces. A photograph showing the contents of the kit accompanies the report.

PB 34762. KERSHNER, R. B. Powder-driven post-hole digger. Final report. (OSRD Rept 5867) Dec 1945. 15 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report describes the development work on a powder-driven post-hole digger. Two entirely different charges were developed, one based on a rocket principle and using a black-powder charge; the other based on a gun-recoil principle and using a gun propellant. The report describes preliminary considerations leading to the development of both these charges. It also describes the experiments that clearly demonstrated the feasibility of both, but the superiority of the gun-recoil, or projectile method. Experiments produced consistent penetrations of from four to six feet, remarkably independent of the nature of the ground. The report also discusses certain mechanical considerations that arose during the tests. Table, photograph and machine drawing are included. Work on this contract with The George Washington University was done at the Allegany Ballistics Laboratory.

PB 31671. MADLE, ALAIN M. Stationary, air-cooled, gasoline engines. (JIOA Rept 77). Jan 1946. 143 p.
Price: Microfilm-$3.00 - Photostat-$10.00
A study was made of the development of small, stationary, air-cooled engines in Germany, information being obtained from manufacturers. The prewar situation was also reviewed. In general, the same type engines were used during the war but research activity was quite intensive up to the end of the war and practical applications of the results of the research can be recognized in the latest engine development. Detailed information, photographs, and diagrams are given regarding the following: Stationary, air-cooled gasoline engines of the "Ilo Werke, H. Christiansen, Hamburg-Pinneberg; Fichtel & Sachs A.G. Schweinfurt A.M.; stationary air-cooled engines; "Zündapp" two cylinder, stationary, air-cooled engine, Zündapp Werke, G.m.b.H., Nürnberg; starter engine of the Hirth Motoren Werke, Stuttgart-Zuffenhausen; Fichtel & Sachs-Bosch, two cylinder starter engine; Riedel starters; Heinkel-Hirth, four cylinder, air-cooled engine for the "Bordsatz 19-109A"; two cylinder M-S.U. engine for the Ural tree saw, produced by N.S.U., Neckarsulm, Wuertemberg; one cylinder "Ilo" engine for the "Dolmar" tree saw; the 1.4 liter four cylinder engine of the Triumph Werke, Nuernberg.

PB 32861. MARCHANT, D. W. and HANSON, ARTHUR C. Comparative properties of copper plating and Parco Lubrising when applied to gear teeth. (Rock Island Arsenal Lab Rept 45-343) Jan 1945. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
The object was to determine the comparative value of copper plating and parco lubrising as run-in mediums for worm and worm gear sets, and their relative catalytic effects on the oxidation of grease, since some trouble had been experienced with the galling of steel-on-steel elevating gear sets during their initial break-in. It was indicated that the

wear on parco lubrized gears was slightly less during the 10,000 cycle test than that on copper plated gears, and that both were within the tolerance for backlash, at the conclusion of the test. The induction period for the oxidation of grease in the presence of copper was 15 hours while with parco lubrizing the end of the induction period had not been reached after 100 hours.

PB 34738. BOTCH, C. H. A new coke breaker. (BIOS Final Rept 391, Item 30) Feb-Mar 1946. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00

The firm of Krupp Treibstoffwerk in Wanne-Eickel was revisited Feb 12, 1946 in order to study a new type of coke breaker. A diagram illustrates the description of the breaker in which coke slabs are broken by the impact from above of reciprocating hammers whose weight and height of free fall may be altered to suit the circumstances. The hammers, which may be driven by cams or by other means, are actually transversely-disposed steel sections fitted beneath with protruding bolts "fingers" in one row or more to break into the coke slabs. A reduced amount of unwanted smalls or breeze is obtained by this new coke breaker. Two tables show the advantages of the new breaker over a normal roller breaker. In the view of the writer not only coal but also gas coke, especially of the softer kinds, could be treated with advantage in a breaker of this type. For prior report on the Krupp Treibstoffwerk, see PB 4325 in this Bibliography, v. 1, p. 328.

PB 34013. TARNEY, A. B. and others. Hosiery needle making industry. (BIOS Final Rept 347, Item 31) Mar 1946. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00

Two German hosiery machine needle manufacturing plants were visited for the purpose of obtaining information, through observation and by interviews with key personnel, concerning their pre- and postwar, as well as wartime production methods, machinery and output. An exhaustive study was made of one of the plants--Theodor Gros & Sons, Ebingen and Bitz, in Württemberg. The other plant, Metwar Metal, Warren Fabrik, Aachen, was no longer in operation.

PB 28574. U. S. ENGINEER BOARD. Disassembly and loading of quick-way convertible unit mounted on a Coleman truck chassis for air transport. Jan 1944. 45 p. Price: Microfilm-$1.00 - Photostat-$3.00

It has been found that the Quick-Way Convertible Unit, mounted on a Coleman Truck chassis may be transported in the C-47 Cargo Plane. To do so, it is necessary to disassemble the crane and truck and group the sub-assemblies into weight groups of approximately four thousand pounds. The groupings and loading include crane, dragline, shovel, piledriver and clamshell attachments. The total weight of the truck and convertible unit with attachments is sixteen tons which necessitates a minimum of eight planes to transport it. It would require seven men working a total of 184 man-hours to dismantle, load, unload, and reassemble the unit. Photographs of the unit and its components, photographs of loading operations, diagrams of cradles used, and diagrams of C-47 planes with regard to center of gravity are included in the report.

PB 36761. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, INDIANA. Cutters, wire, M-1938, dielectric strength test. (Rept 152) Apr 1945. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00

When recent samples of wirecutters were tested for the dielectric strength of the handle insulation, according to Quartermaster Corps tentative specifications J.Q.D. 34B, dated Aug 17, 1942, arc-over occurred at or below the required test peak voltage of 30,000 volts. Since it was the intent of the specification to test for puncture breakdown of the dielectric, the arc-over invalidated the results. This investigation was undertaken with the purpose of determining possible modifications of the method to eliminate the arc-over difficulty encountered with current production of wire cutters. It is concluded that arc-over does not occur at 30,000 peak volts if 3 ins. of handle insulation are left unimmersed; arc-over does not occur at 20,000 peak volts with either 2 ins. or 1-1/2 ins. of handle insulation immersed; it is preferable to test the dielectric at a lower voltage than the present 30,000 with 2 ins. of handle insulation unimmersed. A test peak voltage of 30,000 is suggested.

PB 36772. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, IND. Tests on pulleys and snaplinks. (Rept 60) Sept 1944. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00

The transporting of personnel and supplies across streams and ravines, and up and down steep cliffs and icy slopes focused attention on the need of a small sturdy pulley of versatile manipulation and use. This report deals with tests performed on a pulley and accessory snaplink designed to fulfill these requirements. It is concluded the sample pulley which consists of an aluminum sheave having a bronze bearing is light and easily incorporated into a rope assembly. It resists deformation or operational failure under moderately heavy loads whether applied gradually or instantaneously. It functions adequately in conditions of freezing rain or dust. It is smoothly finished and apparently does not cause damage to rope in use. When operated rapidly under relatively heavy load, the pulley becomes warm and some abrasion of metal parts occurs but there is no significant loss of operating properties; neither the aluminum nor the steel snaplink was able to withstand the sudden-load test given the pulleys. Photographs are included.

PB 34742. WILKINSON, H. and THRONDSEN, I. B. Ampoule and vial making machines, improvements and developments in Germany. (BIOS Final Rept 554, Item 22, 31) n. d. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00

The largest part of the German capacity for ampoule and vial production is situated in Thuringia in the Soviet Zone, where there are about 180 ampoule machines, and a maximum production capacity of about 1,000 million ampoules a year. Apart from the machines in Thuringia, this report states that the only machines in operation in Germany were those in the Ambeg works in Berlin and two ampoule making machines which, with three bottoming machines, had been transferred to I. G. Leverkusen during the war. The Leverkusen machines were understood to be using Ruhr tubing which was not at present satisfactory. The general situation in regard to vial production was much the same as for ampoules. The following developments and improvements are described: Ampoule stem centering device; ampoule constriction control device; double ampoule device, and ampoule stem gaging attachment for mounting on standard Ambeg ampoule making machine type U.1; 16-head automatic Ambeg ampoule making machine; and improvements on molded ampoule making machines and glass tubes. A description is given of a visit to the firm of Ambeg (Automatische Maschinem zur Bearbeitung des Glases, Berlin - Schöneberg), manufacturers of machines for the automatic production of

ampoules and vials, and of other machines used in connection with the production of these goods from glass tubing. They also manufacture the finished products on machines of their own construction. No drawings are shown in this report; they have been forwarded with samples to: Board of Trade, German Division, Lansdowne House, Berkeley Square, London, W. 1.

MEDICAL RESEARCH AND PRACTICE, INCLUDING CLINICAL APPLICATION OF DRUGS AND PHARMACEUTICALS

PB 13080. GERMANY. REICHFORSCHUNGSRAT. Medicine (List of medical research projects; general correspondence and projects concerning dermatological research) Aug 1944 - Dec 1944. (ALSOS:HFR 307) 18 p. Price: Microfilm-50¢ - Photostat-$1.00
This document includes general administrative correspondence pertaining to a dermatological research project and a list of various research undertakings sponsored by the Surgeon General of the German Air Force and the Aviation Ministry. Titles of the projects and of the research facilities concerned are given. General medicine, aviation medicine, hygiene, air-raid protection and other fields are covered.

PB 23071. GERSTELL, RICHARD. A new test for demonstrating the effects of milder degrees of anoxia. Final report. (Bur of Medicine and Surgery Res Project X-282) Feb 1946. 18 p. Price: Microfilm-$50¢ - Photostat-$2.00
Seven essentials of effective tests for demonstrating the effects of anoxia are listed. A new card-sorting test for demonstrating the effects of anoxia is described. Over 300 officers and men undergoing routine oxygen indoctrination were given the new card-sorting test. Nine out of every ten of these individuals made higher scores on oxygen than while anoxic. The average difference in scores (0 to 100 basis) made under these two conditions was 57 points. Data obtained from approximately 150 individuals used as controls indicate that roughly one-third of the scoring differences noted may be due to the learning factor. This has purposely been taken advantage of in administration of the test. It is concluded that with minor revisions and improvement the new test can successfully be used to demonstrate the milder degrees of anoxia to those undergoing routine oxygen indoctrination. Two tables and two sheets of pictures are attached.

PB 23595. KLIEWE, H. Professional correspondence and file memoranda on chloramine as a disinfectant. (ALSOS Kliewe T 1). 1942-1943. 163 p. Price: Microfilm-$2.00 - Photostat-$11.00
This report contains correspondence between a Dr. Kliewe, military surgeon in the "Militärärztliche Akademie", and the Fahlberg-List A.G., Chemische Fabriken, Magdeburg, covering the period December 1941-August 1943, and dealing with tests made by Dr. Kliewe on various chloramine preparations manufactured by Fahlberg-List, to determine their value as disinfecting agents. Reports on specific tests of such preparations as mono- and dichloramine, "tertisept"(a chloramine-sodium compound) "zykosept" (a chloramine-magnesium compound), "sagrotan", "caporit", etc., and their use as disinfectants for hands, clothing, and rooms as a bactericidal agent against tubercle bacilli (in sputum and clothing), typhoid bacilli, B. coli and Staphylococci, and as a delousing agent are included. In German.

PB 23675. KRÜPE, MARTIN. Die senkungsbereitschaft menschlicher erythrozyten in verlauf der blutkonservierung (The sedimentation tendency of human erythrocytes in the course of blood preservation). (ALSOS Mission Hoyt File) Jan 1943. 31 p. Price: Microfilm-50¢ - Photostat-$3.00
Object of the study was to ascertain whether blood that had lost its physiological properties during storage outside the human body will recover them after transfusion. In the introductory part of the paper Frimberger's explanations of the mechanism of erythrocyte sedimentation are presented. Contrary to animal erythrocytes, human ones have a high agglomeration tendency if suspended in preserving solutions. Systematic experiments were carried out to determine (1) the osmotic resistance of the erythrocytes of blood stored between 11-49 days (a) for samples of whole blood (b) for samples of twice washed erythrocyte sediment, (2) the influence of the temperature on the sedimentation rate; (a) the samples were not heated, (b) the samples were allowed to adjust to room temperature for 20 hours before the sedimentation test, (c) the samples were heated to 37°C. 3 hours before the test, (3) the influence of temperature on the tendency of erythrocytes to agglomerate (a) the samples were previously not heated (b) the samples were heated to 37°C. 3 hours before the test, (4) same as (1) under the influence of temperature (a) the samples were previously not heated, (b) the samples were heated to 37°C. 3 hours before the test, and (5) the agglutination of 1% erythrocyte suspensions (three samples of blood groups A, A_2, and B) with Anti-A — or Anti-B - isosera at room temperature. The results of these experiments are presented in 4 tables, 5 graphs and 3 pictures. A bibliography of 21 items is also attached.

PB 19445. RAUSCH, WALTER. Sericin (Sericin). (Reichsforschungsrat) (ALSOS Mission, HFR 307 32) Oct 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
Investigation of cultures of various types of bacteria on sericin, a byproduct of silk manufacture, revealed that this substance is equal, and, in some instances superior, to agar-agar as a culture medium. The article also describes tests of the chemical and physical properties of sericin; diagrams illustrate the apparatus used and the results obtained in these tests. In German.

METALS AND METAL PRODUCTS

PB 33296. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 196. Jan - Feb 1946. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
Summaries of BIOS interim reports Nos. 3689 to 3668 inclusive on German industry present in tabular form name of each factory visited, location, condition, and principal products as follows: Krupps-Friederich Alfred Hütte, Rheinhausen (Welding shop and electrode production); Ruhrstahl A.G., Annener Gusstahlwerke, Annen, (Undamaged - Large centrifugal casting roller machines); J. S. Schweitze, Düsseldorf (Partly damaged, non-ferrous sand and centrifugal foundries); Dr. Jean Maeder, Duisburg (Welding); Piel & Adey G.m.b.H., Solingen (practically undamaged, non-ferrous permanent-mould gravity die-casting foundry); Wilhelm Prinz & Co., Rheydt, (Undamaged, casting and machining of large piston rings); Doehner, Letmathe, (production of transformer silicon stripe); Hochspannungs Gesellschaft, Cologne, Zollstock, (badly damaged, transformer steels); Eisen Metallindustrie, Wattenscheid, Essen, (manufacturer of stampings); and Gebrüder Tiefenthal, Velbert (undamaged, malleable iron foundry).

PB 33304. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 288. Feb-Mar 1946. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a condensation of B.I.O.S. Reports Nos. 4891-4900 regarding certain metal products plants and a metallurgical research firm visited in Germany. The name of each plant, its location, personnel seen, summary of final report, and condition of plant and period to start production where given, are listed. Following are the names of plants and locations, with products and special features, if any, in parentheses: Vereinigte Sauerstoffwerk (Oxygen Works), Hamburg (oxygen cylinders); Hanseatische Acetylene Gas Co., Hamburg (acetylene cylinders); Dr. Hugo Stolzenberg, Hamburg (gas masks & filters); Press & Walzwerk A. G., Düsseldorf (high-pressure vessels); Bochumer Verein, Bochum (hollow forgings & pressure vessels); Krupp, Essen (forging presses); Mannesmann Rohrenwerke, Witten (steel works); Ceram R.m.b.H., Berlin (metallurgical research); Norddeutsche Affinerie, Hamburg (electrolytic copper & other metals); Bleihütte Minsfeldhammer (branch of Stolberg Zinc A. G.), Minsfeldhammer nr. Stolberg (lead production).

PB 33305. BRITISH INTELLIGENCE OBJECTIVE SUB-COMMITTEE. Preliminary reports list no. 295. Mar-Apr 1946. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a condensation of B.I.O.S. Reports Nos. 4965-4974 regarding metal plants visited in Germany. The name of each plant, its location, personnel seen, summary of final report, and condition of plant and period to start production where given, are listed. Following are the names of plants and locations, with products and special features, if any, in parentheses: Rhein Mescher Armaturenfabrik G.m.b.H., Duisberg (copper tuyeres); Siegländer Kupferwerke, Siegen (copper tuyeres); August Thyssen Pt. 37 Blast Furnace Plant, Hamborn (copper tuyere investigation); Rohstoffbetrieb (Vereinigte Stahlwerke), Siegen (concentration of manganiferous iron ore); Akkumulatoren Fabrik A. G., Hagen (content of antimony in plate grids); Dango & Dienenthal, Siegen; A/G für Stickstoffdünger, Knapsack at Cologne (carbide furnaces); Degussa, Werk Knapsack; Elektrowerk Weiweiler, Weiweiler at Aachen (proposed manufacture of calcium carbide); and Gelsenkirchener Eisenwerke (Mineral Plant), Gelsenkirchen (metal wool).

PB 33306. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 300. Mar-Apr 1946. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a condensation of B.I.O.S. Reports Nos. 5031-5042 regarding metal plants and a research institute visited in Germany. The name of each plant, its location, personnel seen, summary of final report, and condition of plant and period to start production where given, are listed. Following are the names of plants and locations, with products and special features, if any, in parentheses: A.G.F. Bergbau Hüttenbedarf, Salzgitter (Hametoq iron powder); Hanomag, Hannover(Hametoq & Vogt powders); Vereinigte Deutsche Metallwerke, Lüscheid Altenna (Hametoq powder & sintered iron); Mannesmann Rohrenwerke A.G. Abt Forschungs Institut, Duisburg-Huckingen (iron powder); Deutsche Edelstahl Werke, Hochfrequenz-Tiegelstah B.m.b.H., Bochum (iron powders); Deutsche Eisenwerke A. G., Mülheim treatment of steel & iron powder); Demag, Wetter/Ruhr ("Presako" sintered bearings); Sintermetallwerk, Krebsoge, Rheinland (processing of metal powders); Ringsdorff Werke, Mahlen am Rhein Bonn (testing sintered steel & iron); Kaiser Wilhelm Institut für Eisenforschung, Clausthal-Zellerfeld (iron powders & sintered steel); Schwelmer Eisenwerke, Müller & Co., Schwelm/Westph. (sintered iron driving bands); Vereinigte Leichtmetall Werke, Hannover Linden(aluminum powders).

PB 36647. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list No. 316. Feb-Apr 1946. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
BIOS interim reports Nos. 5220-5229, inclusive, give brief data as to location and chief manufacture of ten German industrial plants, as follows: (1) Lüttgens u. Engels, Solingen-Grafrath (cold rolling mill); (2) Walz- und Röhrenwerke, Haan (cold rolling mill); (Bochumer Verein, Bochum (rolling mill); (4) Hoesch A.G., Hohenlimburg (strip mills); (5) Dortmund-Hoerder Huttenverein, Dortmund (forging presses); (6) Gusstahlwerk Wittaan, Hagen-Haske (foundry); (7) Siebtechnik G.m.b.H., Mülheim (grinding mills); (8) Preussische Bergwerk Halton A.G., Preussag (ore treatment plant); (9) Hoesch Aktiengesellschaft, Dortmund (forging presses and furnaces); (10) Hoesch, Dortmund (steel processing; "Steckel mill").

PB 36829. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list No. 380. Mar Apr 1946. 17 p. Price: Microfilm-$1.00 - Photostat-$2.00
Summaries of BIOS interim reports Nos 5911 to 5925 inclusive on German industry present in tabular form, name of each factory visited, location, conditions, and principal products, as follows: Felton Guilleaume, Cologne - Mülheim, (slight damage, non-ferrous plant); Rheinmetall Borsig, Düsseldorf-Grafenberg, (Roof damage, Light alloys); Gutehoffnungshütte, Oberhausen, (Undamaged, Electrode production); Deutsche Edelstahlwerke A. G., Anierbeck nr. Dortmund, (Undamaged, Production of magnets); Hockfrequenz - Tiegelstahl G.m.b.H., Bochum, (Operating 50%, Magnet and alloy steel castings); J. G. Farbenindustrie, Leverkusen-Rheinland, (10% damaged, study of corrosion and chromide); Fried, Krupp, Essen, (Badly destroyed, Mfg. sintered blanks from scrap aluminum nickel); Osnabrücker Kupfer und Drahtwerk, Osnabrück, (Undamaged, tinning of copper wire); Lurgi Thermil, Horrern, (Undamaged, Mfg. aluminum silicon alloy); Rheinische Blattmetall, Grevenbroich nr Düsseldorf, (Undamaged, Production of aluminum foil); Deutsche Edelstahlwerke, Krefeld, (Damaged and looted, Mfg. metal forgings); Deutsche Edelstahlwerke Research Laboratory, Krefeld, (Undamaged but looted); Krupp, Essen, (Partly destroyed, Mfg. electrodes); Arcos, Aachen, (one shop out of four destroyed, Mfg. electric welding electrodes); and Otavi Minen & Eisenbahn Gesellschaft, Spandau, Berlin, (Mineral stocks and research).

PB 36827. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list No. 386. Mar-May 1946. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
Summaries of BIOS interim reports Nos. 5975 to 5982 inclusive on German industrie present in tabular form, name of each factory visited, location, condition, and principal products, as follows: Schmalbach Blechwarenwerke, Brunswick, (Solder used in can manufacture); Aluminum Folien Walzwerke, Cologne, (Undamaged, Mfg. aluminum foil); Phönix Westfalische Union, Hamm, (Electrode extruding shop); Röseler Draht A.G., Waldnice nr München-Gladbach, (Inappreciable damage, Wire products); Hösch A.G., Dortmund, (General damage, Mfg. steel strip conveyor bands and aluminum clad strips); Eisen und Hüttenwerke, Bochum, nr. Dortmund, (Steel products); Ruhrstahlwerke, Witten-Dortmund, (35% destroyed, Mfg. perforating punches and dies); and Martinswerke G.m.b.H., Berghein, (Power station badly damaged, aluminum production).

PB 36815. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 411. Mar-May 1946. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00

This is a condensation of B.I.O.S. Reports Nos. 6254-6284 regarding certain steel works and plants visited in Germany. The name of each plant, its location, condition, period to start production, personnel seen, date of investigation, documents to be evacuated, and brief summary of final report regarding products, and sometimes equipment and methods, are listed. Following are the names of plants and locations, with products and special features, if any, in parentheses: Schloesmann AG, Krurmenweg nr. Ratingen (hydraulic presses, rolling mills); Reichswerke, Watenstedt nr. Brunswick (molds); Radium Elektrizitäts GmbH Glühlampenfabrik, Wipperfurth nr. Düsseldorf (electrical products, tungsten, wire, lamps, etc.); Deutsche Eisenwerke, Mülheim Ruhr (ingot molds); Bochumer Verein, Bochum (blast furnace, steel works, rolling mills); Ruhrstahl Henrichshütte, Hattingen/Ruhr (cement moldings); Ruhrstahl Henrichshütte Stahl Werke, Hattingen/Ruhr (steel works); Krupp AG, Essen-Borbeck (open hearth steel works); August Thyssen-Hütte, Hamborn Works (rolling mills); Krupp AG, Essen (special steels); I. G. Dahmen, Iserlohn (brass bronze & nickel wire).

PB 32178. BRODE, WALLACE R. and SCRIBNER, BOURDON F. Standard and reference samples for spectrographic analysis. (Revision of final report, PB 32177). (War Metallurgy Committee Res Rept M-119) Jun 1944. 44 p. Price: Microfilm-$1.00 - Photostat-$3.00

This report is a revision, brought up to date, of War Metallurgy Committee Research Report M-40, (PB 32177). The authors divide their discussion into two parts: Part I, comprising an introduction, followed by a discussion of definitions and nomenclature; and Part II, a survey of available standard samples, namely, iron and steel; aluminum and magnesium and their alloys; copper, brass and bronze; tin, lead and zinc; and miscellaneous materials. Twenty-eight tables complete the document.

PB 32177. BRODE, WALLACE R. Standards for spectrographic analysis of metals and alloys. Final report. (For revision of this report, Jun 23, 1944, see PB 32178). (War Metallurgy Committee Res Rept M-40). Jul 1943. 80 p. Price: Microfilm-$2.00 - Photostat-$6.00

This survey was made for the War Production Board at the request of the American Society for Testing Materials, the work being done at Battelle Institute at Ohio State University, Columbus, Ohio. The report lists all present available standards for spectrographic analysis and their sources. The investigator found that certain fields, such as the aluminum industry, had a very satisfactory series of standards, while many other fields were completely lacking in standards satisfactory for control analysis. No detailed description of procedures is given, information being limited to general suggestions whose consideration might lead to improved accuracy in analysis or speed of operation. Many tables are included in the report. PB 32178 is a later revision of this work.

PB 34061. CARTER, H. G. 105 m/m breech ring: Metallographic examination of tensile bar #7... (Watertown Arsenal Lab Rept 312/79) Jun 1941. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00

Observations are made on the properties of a steel tensile bar, but no conclusions as to acceptability are given. Photographs and photomicrographs are attached.

PB 31940. CHURCH, A. T. Submarine fragment, examination of: Captured enemy equipment. (Naval Eng Expt Station Test C-87) Aug 1943. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00

Neither chemical, microscopic, tension nor hardness tests revealed any essential difference between the material in various sections of this steel plate fragment and the materials used by the Navy for similar purposes. Photographs of various sections of the plate, photomicrographs, and a diagram showing the assembly of the steel portable nipple are included in the report.

PB 31583. CUNNINGHAM, ALLAN. Technology of aluminum and aluminum alloy production in Germany including early fabrication and recoveries from scrap. (FIAT Final Rept 731) Feb 1946. 136 p. Price: Microfilm-$3.00 - Photostat-$9.00

This is an extensive report on aluminum and aluminum alloy production in Germany during the war years. The data contained herein were obtained by means of visits to twenty-three German plants engaged in one phase or another of the aluminum industry, interviews with plant personnel, technical papers published recently in Germany, and data obtained from the reports of other American and British investigators who have covered parts of the aluminum field. Production of aluminum from bauxite, production of silumin and hydronalium, and the recovery of aluminum alloys from scrap are among the topics covered. The only perfected process for recovering aluminum from domestic materials was in the production of "Silumin", a trade name for alloys of aluminum and silicon produced from kaolin. During the war the Germans revived and perfected alloys of the Al-Zn-Mg series. Extended data are presented on this subject.

PB 33209. DEGARMO, E. PAUL and others. Residual stresses in ship welding. Progress report, Jul 1 - Nov 1, 1945. (OSRD Rept 3176; War Metallurgy Committee Rept M-190) Jan 1944. 80 p. Price: Microfilm-$2.00 Photostat-$6.00

This report, prepared at the University of California discusses the work done preliminary to the study of residual stresses in actual ship sub-assemblies. This work comprised establishing a satisfactory method for measuring residual stresses and determining the stresses and stress patterns which could be expected in intersecting butt welds under a number of welding conditions. Preliminary to making residual stress studies on 27' x 60' deck sections for C-4 ships, studies were made on 6' x 8' panels composed of 3' x 4' plates. It was found that satisfactory reproducibility could be obtained to permit the determination of the effects of different variables. Panels welded by union melt and manual procedures showed no significant difference in stress magnitude or patterns. The magnitude of the residual stresses was somewhat lower when electrode having a lower yield point was used. No increase in stress was obtained when welding proceeded from the edges toward the center instead of from edge to edge. Severe boundary restraint produced no significant change in stress except at the outer edges adjacent to the restraining frame. When one-half of a panel was maintained at 75°F. higher temperature than the other half during welding, significantly lower stresses were observed in certain parts of the panel. The report contains numerous tables, diagrams, and illustrations. Appendix A, describes technique of using SR-4 strain gages; Appendix B describes procedure for removing plugs containing gages; Appendix C gives method of converting measured relaxation strains to residual stresses; and, Appendix D contains stress patterns for preliminary test panels. See also PBs 33210 and 33211.

PB 33210. DEGARMO, E. PAUL and others. Residual stresses in ship welding. Progress report, Nov 1, 1943-Feb 29, 1944. (OSRD Rept 3698; War Metallurgy Committee Rept M-266) May 1944. 51 p. Price: Microfilm-$2.00 - Photostat-$4.00

This report prepared at the University of California, presents the results of an investigation of the residual welding stresses in the welds of 27' x 57' x 31/32" deck panel of the C-4 troop transport. The residual welding stresses were found to be in substantial agreement with those which were found in panels as small as 4'x6'x 1". Transverse stresses were much lower than longitudinal stresses. Stresses in the plates were negligible. Welding from the center towards the edges gave somewhate lower stresses. Block welding produced somewhat lower stresses than other procedures. Step-back and straightforward block welding gave almost identical results. Step-back block welding from the center toward both ends of the plate produced lower residual stresses than any of the other procedures. The purpose of this project was stated in the previous progress report (PB 33209). The determination of the residual stresses in three large deck panels from C-4 troop transport, welded by different sequences, has been completed. It was apparent that the magnitudes of the stresses were in very close agreement with those found in the nine smaller test panels. It thus appeared that most effects of sequence variation could be determined from rather simple and small test panels. Additional tests were therefore started on a series of small panels, four of which have been completed. The procedure of the tests is described in detail. The report contains diagrams, graphs and tabulated data. Appendix A contains charts showing residual stress patterns for 3 large panels A, B and C. Appendix B contains charts showing residual stress patterns for 4 small panels 11, 12, 16, and 19. See also PBs 33209 and 33211.

PB 33211. DEGARMO, E. PAUL and others. Residual stresses in ship welding (NS-304). Progress report, Mar 1-Jun 31, 1944. (OSRD Rept 4388; War Metallurgy Committee Rept M-370) Nov 1944. 101 p. Price: Microfilm-$3.00 - Photostat-$7.00

The work covered in this report from the University of California is a continuation of that presented in previous progress reports, PBs 33209 and 33210. The purpose of the work is the gaining of information regarding residual welding stresses, their effect, and possible methods of reducing their magnitude. The residual stresses resulting from welding a deck panel of a C-4 troop transport by a sequence favourable to rapid production were determined. A similar panel was made to learn whether the addition of the regular deck beams before welding of the second side would affect the residual welding stress. By making butt Unionmelt and manual welds of 3" to 48" in length the effect of weld length on longitudinal residual stresses was found. Various procedures involving block welding, Austenitic electrode, simultaneous use of two welders, a special cascade procedure, and cooling between the deposit of blocks, were investigated to determine their effect upon residual stresses. The effectiveness of hot peening as a method of reducing residual welding stresses in butt welds in panels having no external restraint in the plane of the plates was investigated. Heating certain areas of weldments to 400° F was found to be a successful method of effecting considerable reduction in residual stresses. Two panels 6' x 12' x 1" containing 12' longitudinal Unionmelt welds were loaded in tension to determine the effect of this loading in reducing residual welding stresses. A study was made of the distribution of longitudinal strains through the thickness of a 1" Unionmelt weld. All procedures are described in detail. The report contains drawings, graphs, diagrams and photographs. Appendices A, B and C on stress computations are included.

PB 32563. DUISBURGER KUPFERHÜTTE, GERMANY. New way for the production of zinc. (BIOS Halstead Exploiting Centre Rept 10602) Nov 1945. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00

This report describes an electrolytic method for obtaining pure zinc by the use of a zinc amalgam, which was developed at the Duisburger Kupferhütte, Germany. The method has two stages: In the first, the zinc ions of the electrolyte are set free on a mercury cathode in such a way that a zinc amalgam is formed; in the second, the zinc of the amalgam is resolved electrolytically and transported to an aluminum cathode for discharging. In this way a zinc was obtained that was up to 99.999 percent pure. The report contains eight diagrams.

PB 18186. DURAL-HEARMEITUNG (Duralumin fabrication). (MIS VII 704 7002655) n. d. 76 p. Price: Microfilm-$1.00 - Photostat-$6.00

This is a handbook issued by an unidentified firm containing instructions on the handling of duralumin and elektron (a magnesium alloy). In addition, general instructions on soldering, welding, and riveting are given. Included are tables of steels for welding, riveting, casting, etc. and tables showing the compositions of various copper, aluminum and magnesium alloys. In German.

PB 23628. EITEL, W. and KOEPPEN, NINA. Emulsionsartige vermischungen von Guss-Stahl mit zementsandformen (Emulsion-type mixtures of cast-steel and cement-sand molds). (FIAT Final Rept 784) Mar 1946. 16 p. Price: Microfilm-50¢ - Photostat-$2.00

Occlusions and the burning of slag to the surface of steel are frequent when casting steel by the Durand cement process. Microscopic examinations were made, and the nature of the occlusions was determined. Microphotographs and drawings are included. This is the third (No. 784) of a series of three FIAT reports No's 782, 783, 784, on cement sand moulds. For FIAT report No. 783, see PB 23627, vol 2, p. 148. FIAT report No. 782 has not yet been received. In German.

PB 33232. KIWEN, C. J. Investigation of electrodes and procedure for making welds to class A armor. (Naval Gun Factory Metallurgical and Testing Sect. Test Rept 16577) Mar 1941. 50 p. Price: Microfilm-$1.00 - Photostat-$4.00

The object of the investigation was to determine the most suitable electrode and procedure for making welds to class "A" armor. No method or technique of welding was found which would prevent the developments of cracks in the armor plate. Joints free of cracks were made with two types of electrodes, but even in these, the percentage of failure was high. Of the electrodes tested 25-20 stainless steel electrodes produced the strongest and most ductile welds. However, in the majority of cases, extensive cracking of the armor was produced by these welds. Phosphor bronze electrodes are indicated by the results to provide the most suitable weld joint of any of the electrodes tested, using the procedure investigated. A tabulation includes the results of the hammer test and the condition of the weld joints prior to the hammer test, the welding procedure, electrode used, type of joint and the test identification number. A photographic record for each test is listed in the "Results of hammer test" or the "Appearance after welding" column. The photographs are included in this report.

PB 33382. FOLDY, L. L. Advantages of aluminum as a dome material--theoretical study. (OSRD Rept 1573; NDRC Rept 6.1-882) Jun 1943. 17 p. Price: Microfilm-$1.00 - Photostat-$2.00
This theoretical study, prepared at the Underwater Sound Reference Laboratories, Columbia University, was carried out in order to supply information as to the possible improvements in the acoustical properties of domes used in connection with echo-ranging equipment. A theoretical investigation of the sound transmission properties of aluminum, steel, and brass sheets immersed in water indicates that aluminum is considerably more transparent acoustically than steel or brass. The difference is significant enough to justify an experimental study of the use of aluminum alloys in place of steel construction of domes for echo-ranging projectors. Data on resistance to corrosion of aluminum are also given. The formulas used, in calculating the transmission curves included in this report, are shown in the appendix which also contains sketches of echo-ranging domes.

PB 39371. GALBREATH, W. W. Cold extrusion process (Neumeyer, Nürnberg, Germany). Preliminary report: Deep drawn steel (stampings) including extrusion of steel (hot and cold) and bonderdrawing process, Nov 1945. (Prepared by Heintz Manufacturing Co., Philadelphia). (Rev. edition of PB 20808, FIAT final report 445, v.1, p. 1108) Aug 1946. 172 p. Price: Microfilm-$4.00 - Photostat-$12.00
This report presents the details of a reported German method of manufacturing tubular products in steel on forming presses using a cold process more nearly approaching extruding than forming, drawing, or stamping as conventionally practiced in the U.S. The Germans are able to make cold steel flow by means of pressure exerted in the same manner that we have extruded tin, lead, copper, brass, aluminum, etc. The dimensions of the cold extruded parts are so accurate that in many cases they will replace parts now made of malleable iron, grey iron, drop forgings, or parts completely machined from bar stock, without any machining at all. The bonderdrawing process seems to be in very general use throughout Germany wherever steel is cold drawn or cold reduced. The process simply means to bonderize the blank or to bonderize the material after each annealing and pickling operation which may have been necessary. By the use of this process the number of drawing operations and also the number of annealing and pickling operations on many parts have been cut almost in half. More than 600 firms in Germany are using this process for cold drawing wire, roll threading screws, cold drawing pipe and on every stamping work where there is any severe reduction. The report incendes twenty exhibits containing drawings, sketches, and notes. Four other exhibits, listed in the report have not been reproduced.

PB 20446. GERMANY. KAISER WILHELM INSTITUT FÜR EISENFORSCHUNG. Gewinnung von elementarem phosphor und von vanadin aus Thomasschlacke (Production of elementary phosphorus and of vanadium from basic Bessemer slag). (ALSOS Mission, RFR 467). Sep 1944. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
The report describes laboratory tests in which subject slag heated with sand could be reduced and 60-90% of the phosphorus obtained through evaporation. Up to 75% of the vanadium could be recovered through roasting the pulverized slag with alkalines and leaching of the vanadium salts. Three drawings included. In German.

PB 33212. GRIFFIS, LEVAN and MORIKAWA, GEORGE K. The behavior of steel under conditions of multiaxial stress and the effect on this behavior of metallographic structure and chemical composition (NS 307) (welded series and special unwelded tests). Second progress report, Oct 15, 1944 - Feb 15, 1945. (OSRD Rept 5348; War Metallurgy Committee Rept M-490) Jul 1945. 46 p. Price: Microfilm-$1.00 - Photostat-$4.00
A series of static flow and rupture tests was conducted at room temperature, on specimens of semikilled medium ship steel in the form of welded and unwelded tubes. Several conditions of multiaxial stress were imposed using different combinations of internal pressure and axial tension on these hollow cylindrical specimens. Stress-strain data were recorded for each specimen from beginning of loading to failure. Results were used to compare the strength and ductility of this welded and unwelded material under different stress ratios, in several conditions of heat treatment; as rolled; when annealed before welding; when annealed after welding; and when annealed before and after welding. A study was made to predict the behavior of the material up to a fracture during a test which involved changing the principal multiaxial stress radio during the test. This report was prepared at the Illinois Institute of Technology. Tabulated test data, stress-strain curves, drawings, and photographs are included.

PB 18527. GUTTMANN, ERICH. Bearbeitungsprüfung von hartmessing unter gleichzeitiger erprobung eines neuen elektrischen schnittdruckmessverfahrens (Working of hard brass and test of a new electrical method for measuring cutting pressure). (MIS VII 70a 7002784) Nov 1931. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This report is a reprint from Werkstattstechnik, vol. 26, No. 14 (1932), of the author's dissertation submitted to the Technische Hochschule, Berlin. It describes a method for testing the performance of hard brass bars under different machining processes by observing the differences between brass bars of similar, and occasionally identical alloy composition, showing varying performance, and between the performance of various parts (e.g., proximal and distal ends) of the same bar. The brass bars No 1, No 2, and No 3-6 were subjected to turning, sawing and drilling tests, and the results measured against those observed with No 3, which showed satisfactory performance. The possible influence of the presence of small amounts of lead was suggested. (No 3 had the smallest lead content of any of the bars tested.) A new electrical method is described for measuring cutting pressure in the turning process. In German.

PB 31938. HAAS, P. W., JR. Aluminum alloy sheets; report of test of captured enemy equipment. (Naval Eng Expt Station Test C-2647) Dec 1945. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
Two aluminum alloy sheets from captured enemy equipment were examined and compared with an American alloy. The results of the spectrographic and chemical (wet) analysis, and the Brinell hardness, melting range, tension, fatigue and metallographic tests are given in this report. Included also are sketches showing details of the flat tensile and fatigue specimens, photomicrographs, and a graph of fatigue test results. No unusual properties were noted.

PB 31937. HAAS, P. W., JR. Report of test of cylindrical springs, CKE #17695: Captured enemy equipment. (Naval Mag Expt Station Test C-2708) Dec 1945. 4 p. Price: Microfilm - $1.00 - Photostat - $1.00
The results of a metallurgical examination of three captured enemy cylindrical springs are presented, and the figures compared with those obtained by examination of American BAR coupling springs. Four photomicrographs are included in the report.

PB 34734. HOWLETT, J. R. B. German steel drum industry. Nov-Dec 1945. (BIOS Final Rept 531, Item 21, 28) 1946. 101 p. Price: Microfilm - $3.00 - Photostat - $7.00
There is no organization of manufacturers in the German industry similar to that obtaining in the United Kingdom, but a cartel was formed in 1933 consisting of the largest firms and this cartel fixed prices of liquid type drums only of 18 to 400 litors capacity. No novel methods of manufacture were found, with the exception of the automatic machine for welding jerricans at Max Brose & Co., Coburg. At the beginning of 1944, Müller & Co., Schwelm, invented a special pourer of simple and unique design, for use with the jerrican, but large scale production did not ensue because of shortage of material and the general dislocation of transport. A drawing of this pourer is shown in appendix C. The only other important container discovered, for storing water in the desert, was produced by Mauser K. G., at Cologne; a drawing is shown in appendix B. Individual reports on the following factories are given: Brosse & Co., Coburg, and Mauser K.G., Waldeck, Neuweid, and Cologne; Mannesmann Rohren Werke, Düsseldorf; Schwelmer Eisenwerk Müller & Co., Schwelm; Mannesmann-Stahlblechbau, A.G., Langechede; and Eisenwerk, Steuber & Lohmann, Herford. Appendix A consists of schematic diagrams of closures, appendix B of drawings of special water container, and appendix C of drawing of jerrican pourer.

PB 34012. HUNTER, R. L. Manufacture of vitreous enamelled sheet iron baths in Germany. (BIOS Final Rept 344, Item 36) May 1946. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
Visits were made to the plants of Herding and Mentrup, Ahlen, Westphalia: Franz Kaldewei, also of Ahlen, and Rankewerke G.m.b.H., Brühl, near Cologne. Since none of these plants were in production at the time of the visit, it was not possible to make any inspection of work in process. The information in this report is therefore based on statements in regard to production methods, materials, and output obtained from the heads of the three firms. Comparative statistical tables are given. Diagrams of various working parts of machinery are also included.

PB 34864. HURLICH, A. A study of the seam welding process applied to prevent stress cracking of the visor of the M1 helmet. (Watertown Arsenal Lab Memo Rept 710/612) Apr 1944. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
Four helmets made from the same heat of steel, two of them edge-annealed and two produced in the usual manner, were examined. The tests made were: (a) Visual examination; (b) ballistic tests; (c) 90° bend tests on sections cut from the visors; (d) hardness surveys of the seam-welded zone; and (e) microscopic examination. Results of the tests, with discussion of their import, are given in this report, along with microphotographs and one graph.

PB 34011. HYSLOP, C. G. T. and others. German nonferrous (copper-base) foundry industry. (BIOS Final Rept 296, Item 21) Nov-Dec 1945. 131 p.
Price: Microfilm-$3.00 - Photostat-$9.00
Eighteen different German nonferrous (copper-base) foundries were visited. The results of the survey appear in this report. In the sand foundries that were investigated nothing special in methods or techniques was discovered. There was little evidence of mechanization or of sand control. Shortage of tin and nickel in Germany explains the lack of emphasis on this industry. One of the most important developments seen was the lining of steel gear wheels with bronze, which is fully dealt with in the report. In general copper-base sand casting during the war was abandoned, except for such articles as would not be satisfactory in lead-bronze or could be produced by centrifugal methods. In every case the machinery, production methods and output of the plant under discussion are presented. Thirty-two illustrations are included in the report.

PB 20011. JAPAN. ARMY ORDNANCE INSPECTOR'S OFFICE IN ITALY. "Ferrital". (Italian technical investigation 332) Dec 1942. 61 p. Price: Microfilm - $1.00 - Photostat - $5.00
One of the Japanese texts is a report on the manufacture of "Ferrital" in Italy, its properties, and uses. According to a paper by Aldo Rage, the Japanese version of which is attached, "Ferrital" is obtained from Italian magnetites by treatment in electric furnaces. An appendix in English shows analyses of these magnetites and of "Ferrital" as well as the results of tests made with projectiles which were fitted with "Ferrital" driving bands. In Japanese and English.

PB 17653. JOINT INTELLIGENCE OBJECTIVE AGENCY. Selected books requested for microfilming on working of metals, powder metallurgy and metal analysis. (FIAT Microfilm Reel NN 56) Jan 1946. 1266 p. Price: Microfilm-$6.00
This report is a microfilm roll on which five books, all in German, dealing with the subjects of powder metallurgy, the working of metals, and metal analysis, have been recorded, by request of the Joint Intelligence Objectives Agency, Washington. Photostat or microfilm copies of the individual books (PBs 33997 to 34001, inclusive) may be obtained separately, as follows:

PB 33997. KIEFFER, RICHARD and HOTOP, WERNER. Pulvermetallurgie und sinterwerkstoffe. (Reine und angewandte metallkunde in einzeldarstellungen. No. 9). (Powder metallurgy and sintar materials. Monographs on pure and applied metallurgy. No. 9) (Enlargement print of part of FIAT Microfilm reel NN 56, PB 17653) 1943. 210 p.
Price: Microfilm-$5.00 - Photostat-$14.00
The book, published by Springer-Verlag, Berlin, is divided into four parts: Part I considers metallic powders in general, their manufacture, and their physicochemical properties; Part II discusses scientific principles of powder metallurgy, with particular reference to the properties of sintered particular reference to the properties of sintered bodies; Part III treats of sintered metals and alloys; and Part IV deals with technical sintered materials. Among the subjects covered in this last section are: High melting metals and their alloys; sintered contact construction materials; porous sintered materials for filters, etc.; magnetic sintered materials; dental amalgams, etc. The text is in German and contains tables and illustration.

PB 33998. HANEMANN, HEINRICH and SCHRADER, ANNELIESA. Atlas metallographicus. Eine lichtbildersammlung für die technische metallographie. Band III: Aluminium. Erster teil: Binäre legierungen des aluminiums (Metallographic Atlas: a collection of photographs for technical metallography. Volume III: Aluminum. Part I: Binary alloys of aluminum). (Enlargement print of part of FIAT microfilm reel M 56, PB 17653) 1941. 128 p. Price: Microfilm-$3.00 - Photostat-$9.00
This work (in German) constitutes a section of a four-volume Atlas of Metallography published by Borntraeger Brothers, Berlin-Zehlendorf. The properties, structure and formation of aluminum alloys are discussed, in text and tables. Twenty-eight plates carry photographs showing the crystalline structure of aluminum alloys. The volume has a subject index and an index of the proper names referred to in the German text.

PB 33999. STEINHAUSER, K. Chemische analysen-methoden für aluminium und seine legierungen. 2 aufl. (Methods of chemical analysis for aluminum and its alloys. 2nd edition). (Enlargement print of part of FIAT Microfilm reel M 56, PB 17653) 1938. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00
This is a German study on the determination of metals in pure and recast aluminum and aluminum alloys. It was published in 1938 by order of the Committee on chemistry (Dr. Schall, chairman), of the Aluminum-Central, Berlin, and gives chemical analyses for various alloys.

PB 34000. BECK, ADOLF, ed. Magnesium und seine legierungen (Magnesium and its alloys). (Enlargement print of part of FIAT Microfilm reel M 56, PB 17653) 1939. 370 p. Price: Microfilm-$6.00 - Photostat-$18.00
The book, published by Julius Springer, Berlin, is made up of a number of monographs, each by a different author or authors, on various aspects of the problem of magnesium alloys. The subject covered, with their authors, are as follows: Raw materials and their production, by W. Moschel, H. Seliger and their production, by W. Moschel, H. Seliger and R. Suchy; Physical properties of magnesium monocrystals and their significance for polycrystals, by G. Siebel; Metallography of magnesium and its alloys, by H. Vosskühler; physical characteristics, by G. Siebel and H. Vosskühler; Tenacity, by W. Buchmann; Chemical properties, corrosion and properties, corrosion and surface protection, by W. Schultze; Smelting and casting, with particular reference to sand-casting, by A. Beck and P. Spitaler; Technology of chill casting, by P. Spitaler; Technology of die casting, by A. Bauer; Technology of pressing, by R. Fiedler; Technology of forging, by H. Altwicker; Technology of rolling, by P. Mensen; Chipping, by O. Reinert; Uses in construction, workshop methods, and examples of uses, by H. J. de Ridder; Magnesium as an elemental alloy, by H. Bohner; Use of Magnesium in pyrotechnics and thermochemistry, by G. Gossbau; Economic importance of magnesium, by W.H.O. Ziegler; and Chemical analysis of magnesium and its alloys, by G. Siebel. At the end of the book is a list of German patents having to do with the preparation, manufacture, and uses of magnesium and its alloys. An index of subjects and of proper names appearing in the volume is included.

PB 34001. FRIEDRICH, WILHELM. Tabellenbuch für metallgewerbe zum unterricht in fachkunde, fachrechnen und fachzeichnen der berufshandwerker- und fachschulen sowie zur eigenen fortbildung und zum praktischen gebrauch für metallgewerbler, techniker und werkmeister. Ausgabe A der sammlung von fach- und tabellenbüchern. 385.-412. aufl. (Book of tables for the metal trades, designed to provide special information and instruction in mathematical calculation and drawing; for use in vocational, trade and professional schools, and for practical use by metal worker, technician and foreman. Issue A of the collection of technical books and books of tables. 385th-412th ed.) (Enlargement print of part of FIAT microfilm reel M 56, PB 17653) 1943. 114 p. Price: Microfilm-$3.00 - Photostat-$8.00
This report is a photostatic reproduction of the original German text. It contains 900 illustrations and many tables. The publisher is Creus, Magdeburg.

PB 34811. JOSEPHSON, GEORGE W. Utilization of blast furnace slag in Germany. (FIAT Final Rept 823) May 1946. 36 p. Price: Microfilm - $1.00 - Photostat - $3.00
This report by a representative of the Technical Industrial Intelligence Division Branch, U. S. Department of Commerce, describes briefly the various ways in which Germany utilized its blast furnace slag. Lump, cast crushed, fertiliser, granulated and foamed slags are considered. Special attention is given to the production of blast furnace cements and slag wool. Twenty-two figures and graphs are included in the report.

PB 20096. KRISCH, ALFRED. Untersuchungen des Kaiser-Wilhelm-Instituts für Eisenforschung über das beschussverhalten von leichtmetall- und stahlblechen. (Light metal and steel plate armor for airplanes.) May 1945. 6 p. Price: Microfilm - 50¢ - Photostat - $1.00
Tests of light metal and steel plates which were made in the Mechanical Laboratory of the Kaiser Wilhelm Institut für Eisenforschung showed that steel plates made of a chromium manganese, vanadium-alloy were far superior to light metal sheets in their ability to deflect projectiles under varying angles of impact. Three light metal plates were tested: Duralumin #3116.5, in thicknesses of 0.8, 1, 1.5, 2,3 and 6mm.; duralumin #3126.5, in thicknesses of 0.8, 1, 1.5, 2,3 and 6 mm.; and hydronalium in thicknesses of 0.8, 1, 1.5, 2,3 and 6 mm. Two thicknesses (1.5 and 2 mm.) of the steel plates were studied. Results of the tests showed no difference in the performance of the three light metals. In the case of the light metal sheets less than 2 mm. thick, penetration occurred at angles of impact of even less than 8°, thus proving that light metal plating of this thickness is not suitable as a protective covering for airplanes. Only those of more than 6 mm. thickness bullets at angle of impact of 20° deflected. In the case of both the light metal and steel sheets it was found that a single layer was more resistant than several layers of the same total thickness. Three pages of illustrations are given, showing the results of the tests. In German.

PB 20124. KUBASCHEWSKI, OSWALD. Zur kenntnis der systeme chrom-tantal, nickel-tantal, chrom-nickel-tantal. (Study of the chromium-tantalum, nickel-tantalum and chromium-nickel-tantalum systems.) (Kaiser Wilhelm-Institut für Metallforschung) n.d. 14 p. Price: Microfilm - 50¢ - Photostat - $1.00
In connection with his studies on the slag forming characteristics of high-melting point alloys, the author conducted roentgenographic, microscopic and thermal investigations of the structure of the chromium-tantalum, nickel-tantalum, and chromium-nickel-tantalum systems. In the chromium-tantalum system, there exists an intermediate phase with a broad range of homogeneity, beginning at about 62 percent tantalum. Only a small percentage of the tantalum is soluble in chromium. In the nickel-tantalum system there are two intermediate phases with a composition approximating Ni_3Ta and Ni_7Ta_6. At 1000°C., 30 percent of tantalum is soluble in nickel. In the ternary system chromium-nickel-tantalum the binary phases Cr_2Ta_3 and Ni_3Ta and apparently completely miscible. The partial area Ni-Cr-Cr_2Ta_3-Ni_3Ta is governed by the eutectics of the three marginal systems, which combine at 1165° into a ternary eutectic, containing 37 percent chromium, 46 percent nickel, and 17 percent tantalum. The components are only slightly soluble in chromium, while chromium and tantalum are extremely soluble in nickel. Tables and diagrams are included. In German.

PB 20446. LUTKEN, W. and others. Abschlussbericht... über die betriebsmässige erprobung der magnetisierenden röstung von eisensandstein und eisenerzen in der versuchsanlage Praschkau. (Summary of a report on the production test of magnetising calcination of iron sandstone and iron ore in the experimental plant at Praschkau.) (ALSOS Mission, EFR 467) 3 p. Price: Microfilm - 50¢ - Photostat - $1.00
This report is the summarization of publications in the "Mitteilungen des Kaiser-Wilhelm-Institut für Eisenforschung." In a generator-gas-fired rotating kiln of 20 cbm up to 96 tons of iron ore per day were concentrated to an average of 3 times the original iron content. This report does not give any details of the construction of the kiln , the magnetic separator or the process itself, but makes reference to previous publications. In German.

PB 34071. MARTIN, A. and REHDER, V. E. Heat treatment: Treatment of end-quench hardenability bars. (Watertown Arsenal Lab Memo Rept 630/9) Mar 1944. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The object was to study some of the pertinent factors in the treatment of (Jominy) end-quench hardenability steel test bars. Various factors, the control of which is essential to obtain consistent and reproducible end-quench hardenability data are discussed. Prior treatments should be done in a larger section than the test bar dimensions. Heating time should be adequate but not excessive. Heating temperatures should be carefully chosen. Quenching procedures should be standardized. Care should be taken to grind for hardness measurements to a depth sufficient to remove all surface decarburization, carburization, etc. Temperature curves and a chart showing effect of depth of grind are included in this report.

PB 20447. NIKOCH, G. and PETER, W. Dauerstand und verfestigungsverhalten wehrtechnisch wichtiger eisenlegierungen mit und ohne kohlenstoff (Fatigue and tempering properties of steel alloys with and without carbon, important for technical war uses). (ALSOS Mission, EFR 467) 9 p. Price: Microfilm-50¢ - Photostat-$1.00
These tests were made with a steel containing 1.38% columbian and .11% carbon which was slowly cooled to obtain the softest possible structure. Testpieces, about 25 mm thick, were then cold rolled down 11, 28 and 48% and tests were made at 500 to 730° C. It was shown that the strain of greater rolling became negligible at 730° C. whereas the less rolled pieces showed a much higher endurance in the lower temperature tests. The appendix shows the result of the tests in graphs. In German.

PB 30830. CHENG, T. T. and SHINN, D. A. Electric resistance seam welded chromium-molybdenum steel tubing, (X4130), Steel & Tubes Division, Republic Steel Corp. (Army Air Corps Materiel Div Memo Rept EXP-M-56-3812) Jun 1941. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report concerns tests to determine the mechanical properties and welding characteristics of electric resistance seam welded chromium-molybdenum steel tubing made from cold rolled strip, formed cold into a butted cylinder and electrically welded. Tension, torsion, fatigue and crushing tests produced no failure in the welded seam in either the as-received or heat-treated tubing. Flattening and bend tests caused some cracking but no opening of the seams, and metallographic examination showed satisfactory grain structure. It was determined that the fatigue properties are comparable to those for seamless tubing, so service testing was recommended. Testing procedure and a discussion of the results are given in appendices. Photographs, curves and data tables are included.

PB 34736. PURDON, F. P. Metallgesellschaft A. G., Frankfurt: Chemicals for phosphating iron and steel. (BIOS Final Rept 257, Item 21, 22) Sep 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
Some details were obtained regarding the preparation of phosphate liquors and their method of application. The liquors are solutions of phosphoric acid containing varying amounts of zinc or manganese phosphate, together with some copper or nickel. An attached table gives the composition of a number of the liquors. These solutions are used in rust proofing and deep drawing of iron and steel plants, cans for foodstuffs, and some cast iron. A recent development is the pickling of mild steel 'slates' for roofing purposes. The report also includes a list of related documents stored with the Board of Trade (British).

PB 28737. ROSS, A. E. Hanomag, Hannover. (CIOS File XXVII-10, Item 21) n. d. 17 p. Price: Microfilm-$1.00 - Photostat-$2.00
The firm of Hanomag A. G., Hannover was visited to study the manufacture of shell driving bands from powdered iron. Shell sizes from 3.7 cm up were made at this plant. It was stated that sintered iron driving bands, saturated with paraffin, had improved gun barrel life as much as 20%. A brief description of the manufacturing process together with some description of the equipment are given in this report.

PB 34854. SHEIBLEY, JOHN W. Research of Light Metal Works of the Sumitomo Chemical Co., LTD., Niihama. (AAF T-2 Air Tech Intelligence Review F-IR-88-RE) Jun 1946. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00 (Limited supply mimeograph 25¢)
This report, lists seven important research projects of the Sumitomo Chemical Co., Ltd.: (1) Extraction of alumina from aluminous shall by the soda-lime process; (2) extraction of alumina from clay by the soda-lime process; (3) extraction of alumina from alunite; (4) extraction of alumina from clay by sulphuric acid process; (5) flotation of diaspore ores; (6) spectrum analysis of aluminum; and (7) manufacture of high purity aluminum from scrap. Details of the first five processes are given in Appendix A, the sixth is still under investigation, and details of the seventh were reported in ATIG Report No. 210

PB 30820. SMITH, L. C. Design-strengthened stainless steel sheet. (Army Air Corps Material Div Memo Rept EXP-M-56-4074) May 1942. 13 p. Price: Microfilm-$1.00 Photostat-$1.00
This report is a comparison of the mechanical properties of embossed and plain corrosion-resistant steel sheet submitted by the Rigid-Tex Corporation, Pittsburgh, Pennsylvania. The material consisted of plain full hard cold-rolled corrosion-resistant steel sheet (17% Cr, 7% Ni) and the same sheet embossed or corrugated with straight lines or a wavy pattern by a cold-forming operation. "Design Strengthening" had no significant effect on the tensile properties of the sheet. Ultimate tensile strength was increased slightly, but yield strength was decreased. On the basis of a limited number of tests, "Design Strengthening" increased the yield and buckling strengths of cylindrical specimens in compression. The fatigue strength of the "Design Strengthened" material was approximately 5 percent lower than that of the plain sheet when bent transverse to the direction of the major pattern line, and over 40 percent lower when bent parallel.

PB 20449. TITANSTAHL als werkstoff für warmfeste bleche (Titanium steel as a material for high temperature resistant plates). (ALSOS Mission, RFR 467). n.d. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes good results obtained in tensile, creep strength, and notched bar impact tests at temperatures up to 500°C. of test pieces from hot rolled plates containing 0.47, 0.66 and 1.21% of titanium. In German.

PB 34961. U. S. BUREAU OF ORDNANCE. Aluminum powder, atomized. (NAVORD Specification 1389) May 1945. 10 p. Price: Microfilm - $1.00 - Photostat - $1.00
Aluminum ingot or aluminum pig containing a minimum of 99 percent free metallic aluminum shall be used in the manufacture of this powder. Chemical compositions and other detail requirements of classes A and B for use in explosives and class C for use in pyrotechnics are specified.

PB 38020. U. S. ENGINEER BOARD. Investigation of plastic and coated metal screening. (Rept 821-1) Sep 1945. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00
Various types of paint coatings were tested to determine their suitability for the protection of metal screening made of bronze, steel and galvanized iron. Tests were also conducted on screening made of nylon, saran and glass cloth coated with phenolic resin for comparison with the metal screening. Of the screens tested, saran and phenolic-coated glass cloth screening were the most durable. Of the coated metal screens, bronze screening, coated with paint conforming to U. S. Army specification No. 3-181 "Enamel, olive drab, rust-inhibiting, type I", was the most durable. It is recommended in this report that saran or phenolic-coated glass cloth screening be specified if the materials are available. However, if metal screening must be used, bronze screening, coated with two coats of paints conforming to U.S. Army specification No. 3-181, type I, is recommended. Metal screening other than bronze should not be used unless absolutely necessary; if used, it should be coated with two coats of No. 3-181, type I, paint. Tables are included.

PB 36777. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, IND. A comparison of the corrosion resistance of nickel and rhodium platings on nickel silver spectacle frames. (Rept 106) Dec 1944. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
The specification for sun glasses, with case, requires the principal metal parts of the clip-on type spectacle to be fabricated from brass, corrosion resisting steel, or nickel-silver. It further requires copper base alloys to be plated with nickel to a thickness of 0.0001 inches or with rhodium. Nickel-silver spectacle frames plated respectively with nickel, rhodium, and with nickel-rhodium combination, were submitted to various corrosive conditions, and the results noted and compared. It is concluded that neither the nickel-plate nor the rhodium plate appears to be of sufficient advantage to warrant exclusive use as corrosion preventing coating on nickel-silver spectacle frames. The nickel-plate offers better protection against salt spray while the rhodium plate gives more protection against acid perspiration. Both types afford good protection against alkaline perspiration and conversely poor protection against tarnish when exposed to atmospheric conditions. The composition of base metal is approximately the same for both sets of frames. The rhodium plating is extremely thin, of the order of 0.000002 inches, whereas the nickel plating is of the order of 0.0001 to 0.0005 inches, similar to that usually found in metallic protective coatings. The combination nickel-rhodium plating appears to offer no better protection than does the nickel or rhodium alone. Tables are included.

PB 36771. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, IND. Evaluation of can, water, 5-gallon (experimental, aluminum). (Rept 37) Sep 1944. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
An evaluation of subject item was undertaken to determine its suitability as compared to the standard steel can. The study of the aluminum container included comparisons with the standard steel can with respect to strength; resistance to the chemical action of acid, alkali, and salt solutions; impairment of palatability of stored potable liquids, as coffee, lemonade, and water; resistance to abrasion; and general inspection of constructional details. The tests employed are those required in specification J.Q.D. "Can, water, 5-gallon", plus other tests as required. It is concluded that the experimental cans as submitted are not as satisfactory as the standard steel items in workmanship, strength, or resistance to chemical action; they are much lighter in weight, however; and the design of the closure assembly permits easy distortion in the aluminum fabrication. Photographs are included.

PB 36763. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, INDIANA. Evaluation of can, water, 5-gallon (experimental, aluminum), second sample. (Rept 151) Apr 1945. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
The results of a survey made on aluminum cans previously submitted by the same company showed that the subject cans were unsatisfactory as compared to the standard steel cans. This report deals with an evaluation of a second sample embodying changes in construction. As before, these cans are compared with the standard steel can and the previous sample of aluminum cans. It is recommended that since the aluminum container has poor resistance to mechanical stresses, and is vulnerable to attack by acids and chlorine, no further work be done on water cans fabricated from this type of aluminum. It is felt that more fruitful results would be obtained if the can were fabricated from a heat-treatable aluminum alloy. Photographs are included.

PB 36770. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, IND. A study of hinge quality and blade hardness as they affect the strength of the shovel, intrenching, M-1943. (Rept 30) Aug 1944. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
A study of this intrenching shovel has been made with special reference to the strength of hinge and blade. This report is a summary of all findings of the project including those of progress reports 1, 2, 3, and 4. Slight cracks not over 1/16 inch in depth, developing at the angle between the horizontal and vertical portions of the hinge during forming operation, did not significantly contribute to failure of the shovel during strength and fatigue tests. Failure of the shovel during fatigue testing was found to occur as cracking of the blade along the spine, and was associated with the hardness of the steel from which the blade was fabricated, occurring more frequently in blades of higher hardness. Cracks produced during forming of hinges were associated with steel having a carbon content of over 0.20 percent. Tables and photographs are included.

PB 20094. WIEMER, HANS. Die für die pulvermetallurgie in Deutschland technisch wichtigen eisenpulver. (German iron powders and their technical importance in powder metallurgy). (Kaiser Wilhelm Institut für Eisenforschung). n.d. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
The author reports on a comparative study of the physical chemical and mechanical properties of five German commercial iron powders which he made in the "Pulvermetallurgisches Laboratorium, Kaiser Wilhelm Institut für Eisenforschung." The method of manufacturing the powder is described, and the results of the tests discussed at length. Two tables are included, one showing results of physical and chemical tests of all five powders, the other giving comparative figures for the mechanical tests (density, tensile strength Brinell hardness) of three of the powders. Two pages of microphotographs are included. In German.

PB 20095. WIEMER, HANS. Entwicklung von kohlenstoff-sinterstählen für waffenteile und andere verwendungszwecke. (Development of carbon-sinter steels for armament parts and other purposes.) (Kaiser Wilhelm Institut für Eisenforschung) n.d. 4 p. Price: Microfilm - 50¢ - Photostat - $1.00
This report describes experiments carried out at the "Pulvermetallurgisches Laboratorium Kaiser Wilhelm Institut für Eisenforschung," to test the chemical, physical and mechanical properties of sintered iron-carbon materials, and the effect on these properties of sinter temperature, length of the sintering period, the atmosphere under which the sintering takes place, and the addition of varying amounts of carbon, with a view to the utilization of such materials for armament manufacture. Four different iron materials were tested and the results are set forth in a table. In German.

PB 30521. HODGE, G. M. Physical properties and weldability of alternate aircraft steels. (AAF Material Center Memo Rept MXP-M-56-4118, Addendum I) Nov 1942. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a test report on the determination of the hardening properties of AMS 6355 steels and of AN-QQ-S-685 steel as effected by welding heat. Two heats of AMS 6355 steel with carbon contents of .30 and .25% were represented. Also determined was the weldability and hardening power of 1 inch O.D. by .063 inch wall tubing of Climax heat No. P-152. Satisfactory 2 pass arc and gas butt welded joints were made in .30 and .250 AMS 6355 and SAE4130 steel plates. The strength of the welded specimens was higher in the .300 than in the .250 AMS 6355 materials and both compared with SAE-4130 steel. There appeared to be some difference in the hardening properties of the .300 AMS 6355 and SAE4130 steel as affected by cooling rate after welding since the highest maximum hardness value in the weld bead test was found in the .300 AMS 6355 material. The added heat of the second pass in the butt joint specimens lowered the hardness in the AMS 6355 steel more than in the SAE4130 so that the relative positions were reversed. In both cases the total hardness variations were comparable. Graphs, tables and photographs.

ORDNANCE AND ACCESSORIES

PB 33986. AMERICAN GAS ASSOCIATION. TESTING LABORATORIES, CLEVELAND. Helium retention apparatus, M1: Handbook of instructions. Aug 1943. 28 p. Price: Microfilm-$1.00 - Photostat-$2.00
This handbook contains descriptive data and instructions for installation, operation, inspection and maintenance of this apparatus which is used with height finders. It consists of a pressure compensation bellows, automatic replenishing valve low-pressure relief valve, replenishing cylinders, and bellows. This apparatus may or may not be equipped with a helium purity meter. Flow sheets and drawings are included.

PB 38184. ANSALDO SOCIETA ANONIMA, GENOA. Attrezzature-lame, Gruppo VIII, sottafusto e sollevamento affusto (Frames - Plates. Group VIII. Lower carriage and mount). n.d. 354 p. Price: Microfilm-$8.00 - Photostat-$24.00
This folder from "Ansaldo, Societa Anonima", Genoa, Italy, contains only drawings prepared by "Odero-Terni-Orlando" of La Spezia, showing structural details of the lower carriage and mount for howitzer 210/22 model 35 M.

PB 38192. ANSALDO SOCIETA ANONIMA, GENOA. Disegni costruttivi per la fabricazione dell' obice da 210/22. VI gruppo-congegno elevazione e mira (Drawings for the construction of howitzer 210/22. Group VI. Elevating and aiming mechanism). 1939-1941. 205 p. Price: Microfilm-$5.00 - Photostat-$14.00
This folder from "Ansaldo Societa Anonima, Genoa" contains 2 over-all and 12 detail drawings prepared by "Odero-Terni-Orlando" for the construction of the elevating mechanism of howitzer 210/22 model 35 M. It contains no drawings for the aiming mechanism.

PB 38182. BESCHREIBUNG UND bedienungsvorschrift der doppeltrommel zu 75 patronen für M.G. 15. (Entwurf) (Description and service instructions of a design for a double cylindrical case for 75 cartridges for the M.G. 15) n. d. 17 p. Price: Microfilm-$1.00 - Photostat-$2.00

This is a double magazine holding 75 cartridges in two separate metal cases so placed on the gun that its center of gravity is on a plane with the axis of the bore. The magazine can be placed on the weapon with the left hand and there is no change in the position of the center of gravity of the weapon as the magazine is being emptied. A handle is attached for convenience in carrying the case. In German. Photographs are included.

PB 32283. BLUME, tr. Firing at marine-targets with radar controlled projectiles (Seezielschiessen mit fun.-geschoss) (BIOS Halstead Exploiting Centre Rept 709) Oct 1945. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a translation of a German report. The subject 38 cm projectiles were battery fired and fitted with the S/60 time fuze, set with a seconds-adjusting key in such a manner that the point of explosion took place at 1-2 km above the surface of the water. The time of flight of the projectile has been precisely calculated. Firing data is included.

PB 30931. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary short description of the sight and calculator installation ZA 44. Oct 1945. (Halstead Exploiting Centre Rept 10016) May 1946. 14 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report described the workings of the Gyro sight ZA 44 Sight and Calculator installation. It consists of a transmitter casing with 3W-transmitters, a housing with two Ferraris motors for lateral and vertical deflection, an electrical auxiliary casing containing amplifiers and transformers, a trainer's telescope and a layer's telescope. The automatic calculator can be switched off by foot pedal when changing targets so that the mechanism rapidly returns to zero. Formulas are given for its electrical operations. A discussion and clarification of some of the calculations by this instrument, follows. This included the reasons for the use of a third gyro, the allowance for the tangent elevation, and the construction of the sight and its attachment to the gun. The ZA 44 is compared to the KR 44. Design drawings, curves and diagrams are included.

PB 34065. BURGHARDT, A. M. Gun tube forgings: 3.7" Gun tube forgings produced by... (Watertown Arsenal Lab Rept 313/29) Dec 1942. 28 p. Price: Microfilm-$1.00 - Photostat-$2.00
The metallurgic characteristics of five different gun forgings (name of manufacturer is deleted from report), and intended for use in loose barrel British 3.7" ML-3 guns, were determined at the Watertown Arsenal by means of macro-examination, chemical analysis and physical tests. Data on the test, with discussion of the results, and photographs of the forgings examined are given in this report.

PB 13725. DEUTSCHE WAFFEN-U. MUNITIONS FABRIKEN. LÜBECK. Auslösung von auf bewegliche ziele, flugzeuge u. dergl. gerichteten geschossen. (Launching of projectiles aimed at moving targets, e. g. aircraft and the like) (German patent application No. D 91 800) Oct 1943. 4 p. Price: Microfilm-$80 - Photostat-$1.00
Ultraviolet or infra-red rays emitted by sources of radiation disposed around the anchoring cable of a captive balloon, or around the balloon itself, are activated by a photo-electric cell attached to the projectile. The sources of light are introduced into the cable at various heights, as desired, and are constantly readjusted in order that they may be adapted to the moving targets. The device is recommended for use in firing projectiles from anti-aircraft guns on targets at varying distances. In German.

PB 22717. EINTEILIGE hülsen (Technical drawings of ammunition casings). 1939, 1943. 69 p. Price: Microfilm-$1.00 - Photostat-$5.00
This report consists of a collection of drawings and specifications (markings and material) of shell cases for all standard German artillery-pieces from the 37 mm. antitank gun to the gamma-mortar.

PB 36206. FARRELL, GEORGE and others. Experimental study of the Mark 25 turbine. Report R-3. May 1946. 64 p. Price: Microfilm - $2.00 - Photostat - $5.00
This study is a part of the development program for a new aircraft torpedo, including a turbine which would incorporate the most modern advances in high-temperature materials, fabrication processes, and the technique of turbine design. The principal object of the tests of this report, prepared by Massachusetts Institute of Technology, was to investigate experimentally the efficiency characteristics of the Mark 25 turbine. These results are given in the main body of the report. A secondary objective was the determination of efficiency for the nozzles used in the turbine efficiency tests in an attempt partially to separate out the losses in the turbine. These results are reported in Appendix A. In addition, Appendix B summarizes some of the mechanical experience gained with the Mark 25 turbine and light gear train. Tabulated data, drawings, photographs, and curves are included.

PB 36204. FARRELL, GEORGE and others. Gas-generating systems for torpedoes, an experimental study of the Mark XX 25-A and Mark XX-25-B combustion pots, using ethyl alcohol and air for combustion. Report R-3. Sep 1945. 43 p. Price: Microfilm - $1.00 - Photostat - $3.00
This report covers work done at the Massachusetts Institute of Technology for the Navy Bureau of Ordnance, and is the third of a series on the subject of gas - generating systems for alcohol-air torpedoes. The thermodynamic performance of the XX-25A and 25-B pots was investigated as regards: (a) the relation between the temperature of the combustion gas and the effectiveness of the gas-generating system for producing power in a turbine or engine; (b) the relation between the alcohol-air ratio and the temperature of the combustion gas; and (c) the composition and properties of the combustion gas. An investigation was made of the durability of the Mark XX 25-A and 25-B pots and to determine whether they can operate at extreme temperatures without external water cooling. Tabulated test data, photographs, drawings, and graphs are included.

PB 36205. FARRELL, GEORGE and others. Thermodynamic properties of gases delivered by the Mark 25 combustion pot. Report R-4. Jan 1946. 22 p. Price: Microfilm - $1.00 - Photostat - $2.00
This report contains tables to facilitate calculations in connection with the study of gas-generating systems for torpedoes, for such processes as the expansion of combustion gas through a turbine (PB 36204).

PB 33947. PITCH, LEE H. Second report on development test of hydro-pneumatic equilibrators for 155 mm gun carriage, M1; and Thirtieth report on ordnance program no. 5084. Oct 1943. 47 p. Price: Microfilm-$1.00 - Photostat-$4.00
Tests were made to determine the effect of sub-zero temperatures on the functioning of the complete hydro-pneumatic equilibrator system, and to determine the loss in nitrogen pressure over a period of time and the effects of the loss on the handwheel efforts. A comparison of hydro-pneumatic equilibrators having standard silver packings, with pneumatic equilibrators having experimental neoprene packings, indicated that the latter are superior both in design and performance. Drawings and photographs are included.

PB 34010. FLATMAN, L. S. and others. German S.A.A. factories. (BIOS Final Rept 295, Item 2) Nov-Dec 1945. 36 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report is the result of a visit to 10 German small arms ammunition factories. Five of these were both component manufacturers and filling factories. One was purely a filling factory, and the remaining four were component factories only. In some cases difficulty was obtained in getting adequate information due to factory destruction by bombing, lack of records and technical information, and the deterioration in the standard of work, which was permitted during the last months of the war. The report discusses inspection methods, packing, and proof of small arms ammunition. Several photographs are included.

PB 18446. GERMANY. ELEKTROTECHNISCHES VERSUCHSAMT DER REICHSBAHN. Bericht L51R/1944 über versuche mit den flaksperrgerät (Report L51R/1944 about tests with the antiaircraft equipment). (AIGOS Mission, RFR 302 c). Aug 1944. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
The report refers to tests of an optical range finder for railroad antiaircraft guns. These tests contained (a) range at day and night, (b) trigger effect of the gun's own smoke and (3) disturbances caused by shock vibrations. In German.

PB 34775. HASKELL, H. A. An analytical approximation for the underwater trajectory of a nonrotating projectile. (OSRD Rept 5445; California Institute of Technology Rept IPC 69) Jun 1945. 38 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report is concerned with the present theory of the underwater motion of a projectile based on two assumptions that constitute a departure from other treatments: (a) that the initial air cavity, shrinks in such a way that the effective buoyance force on the projectile approaches its static value exponentially with distance along the trajectory; and (b) that the equilibrium pitch angle decreases in a similar manner. The above assumptions lead to a linear second-order equation for the pitch angle, and permit trajectories to be calculated without great computational difficulties. An example of the 1-in. diameter model Mark 13-6 torpedo is presented in the report. Numerous curves are included.

PB 36792. HERSHEY, A. V. Analytical summary: Part II. Elastic and plastic undulations in armor plate. (Naval Proving Ground, Dahlgren, Va. Rept 7-46) Jul 1946. 66 p. Price: Microfilm-$2.00 - Photostat-$5.00
The motion of a plate under the action of a constant force is analyzed in order to complete the theory for ballistic applications. The properties of both elastic and plastic undulations in a plate of infinite extent are given for the limiting cases of propagation by pure flexure and by pure extension. An analysis is made of the elastic flexural deformation of a square plate under the action of a force applied at its center. The properties of elastic flexural and extensional deformations are given for circular plates or membranes in a state of vibration and in a state of equilibruim. Tables of functions and coefficients, defining equations for coefficients, and figures are included.

PB 30978. HOCH and LYRA. Research on the stability of the beam guided antiaircraft rocket. German aeronautical research report no. 1892. (BIOS Halstead Exploiting Centre Rept 116/I) Dec 1943. 38 p. Price: Microfilm-$1.00 - Photostat-$3.00
This is a translation of a German report giving the results of systematic research on the longitudinal motion of an antiaircraft rocket guided by a fixed guiding beam. For a favorably selected steering law the limits of stability are examined and the optimum values of setting up are determined. Through these investigations it is claimed in the report that the problem has been provisionally solved as far as motion in one plane and a fixed guiding beam are concerned. The report includes calculations and graphs.

PB 30979. HOCH. Research report on the stability of a beam-guided flak rocket. German aeronautical research report no. 1892/2. (BIOS Halstead Exploiting Centre Rept 116/II) Jan 1944. 46 p. Price: Microfilm-$1.00 - Photostat-$4.00

This report deals with the stability and basic solution of a beam-guided flak rocket by directing the guiding beam in a vertical plane. It is demonstrated that a basic solution maybe specified for a moving guiding beam, which satisfies this system of equations in the main. The assumption that the velocity of flight has to be constant would not be absolutely necessary, but simplifies the problem considerably and leads to reasonable results. For the present case it is proved that the construction of a "dogscurve" may be carried out by compass and ruler. A maximum angular velocity is obtained which must not be exceeded to ensure that the rocket remains in effective range of the guiding beam. The angular velocity has to be inversely proportional to the distance from rocket to transmitter. In is observed in the calculated example that the distance of the rocket is sufficiently small for a beam turning at constant velocity. A perturbation is superimposed on this basic solution during a sudden change of turning velocity. This may become very large, so that there is the danger of the rocket leaving the effective range of the guiding beam. The guide beam transmitter must be built to prevent high velocities and jerky acceleration must be avoided. The report includes calculations and graphs.

PB 18418. KASPEROWSKI. Bericht A 90 R/1943 über besprechungen in RVM betr. entwicklung eines flakseperrgerätes (Report A90R/1943 about discussions at the reichs traffic ministery regarding the development of an antiaircraft trigger blocking device). (ALSOS Mission, HFR 302 0) May 1943. PB 18418. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Subject trigger blocking device is to serve as a protection of the overhead lines of railroads which are easily damaged by railroad mounted guns. It was recommended to study blocking devices such as short range radar or invisible light rays which would be reflected by the wiring and indicated by a photocell. In German.

PB 36954. KELLER, G. Sympathetic detonation: Propagation distances for bare TNT charges in water. (NAVORD Rept 210-45) Dec 1945. 34 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report was prepared as a result of study of the problem of the cause and prevention of mass detonation of munitions stored in a ship's magazine. Tests were performed to determine how far an acceptor charge of 250 lbs. of bare TNT must be separated from an initiator charge of 275 lbs. of TNT in order that the acceptor may not detonate sympathetically. The charges were fired underwater, so that the gap between them was water filled. It was found that in five out of six trials, using a gap of about 4½ feet, the acceptor, while one trial at this distance may have resulted in a low-order explosion of the acceptor. Comparison of these results with data obtained by other investigators indicates that: (a) The critical gap in water is slightly smaller than the 5½ foot critical gap in air. Since the latter figure is based on rather rough calculations, however, the difference may not be significant, and (b) the critical gap in water may be reduced somewhat by enclosing the acceptor in a steel bomb case. Tabulated data and graphs are included.

PB 34757. KOUWENHOVEN, W. B. Development of methods for determining the proper seating of gilding metal rotating bands on 105 mm shells in production. Progress report. (OSRD Rept 4869) Mar 1945. 77 p. Price: Microfilm-$2.00 - Photostat-$6.00
The purpose of this investigation was to develop a nondestructive method for detecting improperly banded shells in production since improperly seated rotating bands have a marked effect upon the muzzle velocity of the shell, and this results in a wide dispersion in the range of the projectiles. Fourteen different methods have been investigated at the Engineering Laboratories of The Johns Hopkins University and their possibilities examined. Graphs and photographs are included. This is the final and complete report of the project. Two earlier reports (PBs 11215 and 11216) are abstracted in the Bibliography in V. 1, p. 797.

PB 20098. KRISCH, A. Untersuchungen des Instituts über das arbeitsgebiet "beschussfreie prüfung von geschützrohren und panzerplatten" (Studies made at the Institute on testing of gun barrels and armor plates). May 1945. 8 p. Price: Microfilm-$50¢ - Photostat-$1.00
The studies reported here were carried out in the Mechanical Laboratory of the Kaiser Wilhelm Institut für Eisenforschung, with the object of assisting the Ordnance Department of the German Army to develop a method whereby the resistance of a gun barrel toward premature explosions could be determined. After preliminary experimentation, "Kilger's small cylinder test" was finally adopted, and used for the duration of the war. In the second section of the article the author describes the nondestructive methods developed for testing the resistance to projectiles of armored turrets and armor plate. Photographic illustrations of the test results are included. In German.

PB 18307. KUHN. Untersuchungen über den spulenoszillographen. (Investigations on the coil-oscillograph.) (ALSOS Mission, Gerlach I7 A 15) n.d. 56 p. Price: Microfilm - $1.00 - Photostat - $4.00
This study investigates and corrects errors on a measuring device for the velocity of magnetized projectiles. The e.m.f. generated by the projectile as it moves through the coils is compared to a fixed sine wave of a known frequency on an oscillograph. In German.

PB 34037. LEA, C. and others. Pyrotechnics with special reference to marker bombs - interrogation of Dr. Feistel. Mar 1946. (BIOS Final Rept 460, Item 17) May 1946. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
Dr. Feistel was a director of the "Deutsche Leucht und Signalmittel Werke, Schlabagen" near Berlin. He discussed the organization of development and production of pyrotechnics for the German armed forces, especially 60 mm and 80 mm skymarkers, 40 mm and 80 mm ground markers, 40 mm rocket markers accomodated in the heads of 8" rockets and used to supplement decoy ground markers by giving the cascade effect, and sea markers in the form of 500 KG and 1000 KG cases filled with floating candles each 4" in diameter and partially filled with composition to float upright. Information was given as to production rates, difficulties with compositions, as well as notes on miscellaneous pyrotechnics. Dr. Feistel spoke from memory and this fact should be borne in mind in assessing the value of the information contained in this report.

PB 27419. LING, D. P. Aerial gunnery and gyro sights: A manual for gunners. (NDRC Applied Math Panel Rept 104.4R; Columbia Univ Applied Math Group Rept 489; OSRD Rept 6284). Oct 1945. 64 p. Price: Microfilm-$2.00 - Photostat-$5.00

This report represents an attempt to state in simple and non-mathematical terms certain fundamental problems of air-to-air fire, and to show how these problems are solved by the single-gyro type of gunsight. The actual discussion is confined to sights of the Mark 18 (Army K-15) class, not only because of the importance of these particular sights, but also because of the general utility of gyroscopes in many fields of instrumentation. The mathematics involved has been limited to the simplest technique of elementary algebra. Graphical methods have been relied on heavily, particularly in the problems. These graphical methods form a singular apt tool for the solution of many of the problems that arise. The following problems are discussed: (1) The relative course; (2) how bullets behave; (3) the lead; (4) the Mark 18 gyro sight; (5)general remarks on Mark 18; and (6) a note on fighter sights. Diagrams are included

PB 31074. LUDWIEG, H. Wind tunnel experiments on the stabilization of unrotated projectiles. Apr 1942. (BIOS Halstead Exploiting Centre Rept 3793) May 1946. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00

Through wind tunnel experiments the center of application of the air forces on the AWA 42.4 projectile of 7.25 caliber length was ascertained at the Aerodynamic Research Station at Goettingen. This projectile was to be fired unrotated. The measurements showed that stable flight was not possible due to the position of the center of gravity. Therefore another form, AWA 42. 4b, was produced which theoretically should give stable flight. Diagrams and graphs are included.

PB 36914. LUUKKONEN, V. A. Report of investigation of timing difficulties with... cal. .50 M2 AC, B.N.G. at... (Springfield Armory Eng Dept Tech Rept WO 375) Dec 1943. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00

According to this report it is believed that the method for checking timing of Cal. 50 guns used by the Army Air Forces, as described in Technical Order No. 11-1-30 (Sep. 21, 1943), should be used by all services so that uniform procedure is followed. In this method, adjustment of solenoid (or Trigger Control) is made so that the firing pin is released on the first operation of the solenoid.

PB 36916. LUUKKONEN, V. A. Tests of central plunger trigger motor, C45991. (Springfield Armory Eng Dept Tech Rept WO 380) Nov 1943. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00

Tests were made of this trigger motor for the Cal. 50 M2 Browning machine gun, using check ammunition at 1570 - 2640 R.P.M. Tabulated data are included.

PB 36951. MCCORKLE, JAMES S. New short time underwater explosion gage. (NAVORD Rept 73-46) May 1946. 22 p. Price: Microfilm-$1.00 - Photostat-$2.00

This report presents a description of a new short reaction time peak pressure gage (indenter gage) designed for use in underwater explosion tests. This new gage has a reaction time of approximately 30 microseconds or about 1/6 of the reaction time of the Naval Ordnance Laboratory Ball Crusher gage which is currently used in obtaining shock wave peak pressure. The short reaction time permits measurement of shock wave peak pressure to within $\pm$ 2% for charge equal to or greater than 60 lbs. of TPX-2 at a distance equal to or greater than 20 charge radii. In the new gage pressure is a function of the size of an indentation made on copper by a pyramid indenter. Actual tests show the standard deviation of the new gage to be 7.2 times greater than the standard deviation of the crusher gage. Tabulated test data, sketches, and a photograph are included.

PB 33944. MANN, H. C. Physical testing: Load test of traversing roller and race materials, 16" Barbette carriage M1919. (Watertown Arsenal Lab Memo Rept 740/14) Nov 1941. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00

The object was to determine the comparative load carrying characteristics of standard rollers against races made from Ordnance cast steel #2 and Cu-Mo cast steel, and to determine if these materials are capable of withstanding service loads without deformation; also to compare the corrosion resistance properties of the two race materials. The load required to produce initial permanent deformation was determined with reasonable accuracy by the following empirical equation: $P = \text{Brinell}^2 \times d \times .06$, where P = load per inch of roller length and d = diameter of roller inches. Complete data was taken as to: condition of races, and rollers before and after tests; physical properties and heat treatment of races and rollers; loading of rollers; maximum and minimum rates of movement, and other factors to be used as basic information to determine the limitations of the design. A graph is included.

PB 30953. MANNS, F., tr. Record of discussion about development of the rockets R A 55. 1944-1945. (BIOS Halstead Exploiting Centre Rept 402) May 1946. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00

This report contains minutes of a number of discussions from July 1944 to March 1945 between Fl. Stabs. Ing. Buhler, Scheibert and Scholler and others on the developmental changes in the RA 55 rocket. Meetings were held at a number of locations. Difficulty had been experienced in experimental firing with the breaking away of the warhead from the shell case. Shortening of the rocket requires a corresponding alteration in the blower chamber. Also the fuses have been damaged in firing the rocket out of the blower chamber and rendered inoperative. A blower chamber to dispatch 30 rockets and with an endurance of 500 to 600 round is aimed at. Test units to measure trajectory and firing accuracy are to be developed. A later conference was on the design of an EZ element attached to the conical extension of the tube of the folding tail unit for electrical ignition. An early conference discussed two designs for a belt conveyor driven by external means or driven by the rocket itself. Another conference dealt with the design of a projecting device for accuracy in firing the rocket. The collapsible tail unit may be responsible for dispersion about the target, so fin stabilized rockets are also discussed. Characteristics data as far as established, is given for both the rocket and the projection tube.

PB 36907. HAIMAN, R. Tests of modified striker, Si-18573, for the cal. .30 M1903 Rifle. (Springfield Armory Eng Dept Tech Rept NO 318) Dec 1943. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
Four modified strikers were tested mechanically and by firing tests, in comparison with four standard strikers, to determine possible improvement in fatigue life.

PB 33949. PETERSEN, A. B. Second report on development test of pneumatic equilibrators with experimental neoprene packings ("O" type) for 155 mm carriage, M1; and Thirty-seventh report on ordnance program no. 5084. (Aberdeen Proving Ground Ordnance Res Center Project 2930, Rept 1) Jan 1945. 76 p. Price: Microfilm-$2.00 - Photostat-$6.00
The results of tests to determine if the experimental "A" type neoprene packings are suitable and satisfactory for the prevention of nitrogen leakage, and whether they are sufficiently superior to the "T" type neoprene packings to warrant adoption as standard in the pneumatic equilibrators, are contained herein. It was found that nitrogen and oil seal leakage was not prevented, that the packings will not withstand operation at subzero temperatures as low as -40° F, and that distortion of the packings resulted from contact with moving surfaces. Photographs, drawings, and tabulated test results are included.

PB 34746. PRINCETON UNIVERSITY. FIRE CONTROL RESEARCH. Contract NDCrc-186: Final report. Volume I: Summary. (Rept 27) Jan 1943. 76 p. Price: Microfilm-$2.00 - Photostat-$6.00
The final report of the study of antiaircraft fire control equipment consists of eight volumes with a total of more than 2500 pages. This document is volume one. Volumes II to VII bearing PB numbers 34136 to 34141, appeared on page 823 of volume 2 of this Bibliography. (For volume VIII, see PB 34747). Volumes II to VIII are made up of separate reports and studies which were prepared and release during the course of the work. Volume I summarizes the results and findings of the study of antiaircraft fire control equipment, with particular reference to heightfinders and rangefinders. It was prepared to serve more as an annotated bibliography than as a complete summary of the work. It is designed as a guide to the complete report. It discusses the organization of the final report, the historical background, the general program and the results, and topics for further investigation. It also gives a condensed table of contents for the whole work and a detailed table of contents for volumes II, III, VI, VII, and VIII. A list of personnel who worked on the project is included.

PB 34747. PRINCETON UNIVERSITY. FIRE CONTROL RESEARCH. Contract NDCrc-186: Final report. Volume VIII: Director studies. Jan 1943. 211 p. Price: Microfilm-$5.00 - Photostat-$15.00
This volume of the final report on fire control research contains the probability studies and performance studies conducted on various fire control instruments. The following studies are included: (1) A theoretical study of the effectiveness of an A. A. battery; (2) scoring heightfinder performance; (3) one-dimensional prediction problems and the theory of rating locators for predicting power; (4) computations for rating of one-dimensional locators for predicting power; (5) the way in which probability of hitting with a time-fused projectile varies with muzzle velocity; (6) formulas for the probability of an effective hit on aircraft by A. A. fire; (7) accuracy of the approximations involved in the factorization of the probability of effective hitting, and in the relation of the pre-burst factor to the trivariance; (8) the application of vector, dyadic, and plurivariance technique to the burst problem; (9) the computational application of the plurivariance to the discussion of hitting problems; (10) elementary exposition of dead-time error in a continuously pointing system; (11) scoring methods for antiaircraft fire control equipment and applications to Fort Monroe director tests; (12) scoring locator performance; and (13) the employment of modal predictors in analyzing director performance. The studies are provided with the tables and curves necessary for presenting data. For other reports on this program, see PB 34746, and PBs 34136 to 34141 (abstracted in v. 2, p. 823)

PB 36203. SHAPIRO, ASCHER H. Contract NOrd-9107, task G, torpedo power plant. Progress report nos. P-28 through P-33. Sep 1945-Feb 1946. 11 p. Price: Microfilm - $1.00 - Photostat - $1.00
These reports contain the partial results of a program undertaken at the Massachusetts Institute of Technology in developing and testing the power plant of the Mark 25 torpedo. Additional results are given in PB 36204 through PB 36206.

PB 36915. STALLER, J. J. Oil buffer packing gland - A153162. (Springfield Armory Eng Dept Tech Rept NO 377) Jan 1944. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
Tests were made on various samples of packing glands for Cal. 50 M2 aircraft machine guns, using lengthened and standard dimension packings of Super Seal #7 material, and lengthened samples of Super Seal #3 material.

PB 36895. SULLIVAN, R. P. and SHEPARD, B. M. Hiwassee Dam recovery net, description and operation. (Naval Ordnance Lab Rept 1004) Jul 1945. 23 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report describes the construction and operation of a recovery net installed at the NOL Experimental Facilities, Hiwassee Dam, N.C. The net is 75 ft. square and can be located laterally at any point along its suspension cables out to the center of the lake and any depth down to 225 feet below high-water mark. The use of this net allows depth charges or other ordnance to the projected or launched into unobstructed water without recovery lines or other encumbrances and be recovered after a free fall through the water of 225 feet or less. This makes possible the study of air- and underwater-flight characteristics of influence-fused depth charges without the use of trailing or self-contained recovery gear. Diagrams and photographs are included.

PB 36020. U. S. BUREAU OF ORDNANCE. Stereo trainer Mark 7 mod.0. (Manufactured by Photoswitch Inc., Cambridge, Mass.). (NAVORD Pamphlet 1011) Jun 1945. 29 p. Price: Microfilm-$1.00 - Photostat-$2.00

This pamphlet describes the operation, adjustment, and maintenance of the subject equipment. The instrument is intended to furnish rangefinder operators and trainees with training in making stereoscopic contact between a target moving in range and a reticle. The instrument is also adapted for training personnel in spotting projectile bursts. Photographs and drawings illustrate the pamphlet.

PB 36877. U. S. WAR DEPARTMENT. Cable system M12 and off-carriage components of the remote control system M14 (for 6-inch Barbette carriages M2 and M4). (Tech Manual 9-627) Feb 1944. 32 p. Price: Microfilm-$1.00 - Photostat-$3.00
This manual contains general descriptive matter and detailed instructions for the identification, operation, and care of this fire control equipment. The M12 cable system, with the off-carriage components of the Remote Control System M14, provides transmission of the gun pointing data from the plotting room to each gun and distributes power to each unit. The cable system includes the Azimuth Transmitter M5 and Elevation Transmitter M8, which are located in the plotting room, for use with the plotting board method of determining data. The off-carriage parts of the M14 Remote Control System are the Motor-Generator M1, and Amplifier M2. A schematic diagram and photographs are included.

PB 36882. U. S. WAR DEPARTMENT. German 7.9-mm dual purpose machine gun MG34. (Tech Manual E9-206A) Apr 1943. 71 p. Price: Microfilm-$2.00 - Photostat-$5.00
This manual contains information required by the using arms to identify, operate, disassemble, assemble, and preserve this German weapon. The MG34 is a recoil-operated air-cooled weapon capable of delivering single or full automatic fire. The 7.9-mm German ammunition used with this weapon is similar in appearance to, but is not interchangeable with U.S. cal. .30 ammunition. Photographs are included.

PB 36878. U. S. WAR DEPARTMENT. German 88-mm antiaircraft gun materiel. (Tech Manual E9-369A) Jun 1943. 183 p. Price: Microfilm-$4.00 - Photostat-$13.00
This manual contains technical information required for identification, use, and care of this weapon, which consists of a detachable breech ring with a half-length outer tube, a half-length inner lock tube, and a loose three-piece liner. The mount is a circular pedestal antiaircraft type suspended from two bogies when in traveling position. Numerous illustrations are included.

PB 36879. U. S. WAR DEPARTMENT. German 105-mm Howitzer materiel. (Tech Manual E9-325A) Jun 1944. 219 p. Price: Microfilm-$5.00 - Photostat-$15.00
This manual includes the technical information required for identification, use, and care of the howitzer, as much as can be ascertained from printed matter and the material on hand. The weapon comprises a tube, breech mechanism, and safety lock. The ammunition for this howitzer differs from U.S. 105-mm ammunition in that the projectile is shipped and loaded into the weapon separate from the cartridge case which contains the propelling charge and primer. The manual is illustrated throughout.

PB 36213. U. S. WAR DEPARTMENT. Indicator, eyepiece leakage, E5. (Tech Bulletin 3-205-16) Jun 1945. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
This bulletin outlines the operation and care of the E5 indicator, used to determine leakage of gas mask eyepiece assemblies, and for testing leakage of the rubber cap for the canister inlet valve which is supplied for waterproofing the lightweight service gas mask canister. Diagrams and photographs are included.

PB 36881. U. S. WAR DEPARTMENT. Instruction guide: Sound ranging plotting board M1. (Tech Manual 9-2684) Mar 1942. 53 p. Price: Microfilm-$2.00 - Photostat-$4.00
This manual covers the general theory underlying the sound ranging plotting board M1, a general discussion of the instrument, complete operating instructions, a detailed description of its parts, and necessary care and adjustments. The plotting board is used by the operation section of sound ranging platoons of an observation battery to determine the terrestrial location of a sound source. Drawings and photographs are included.

PB 36225. U. S. WAR DEPARTMENT. Nonpersistent gas bombs: Handling, shipping, and storage. (Tech Bulletin CW 22) Apr 1945. 43 p. Price: Microfilm - $1.00 - Photostat - $3.00
The bulletin describes procedures to be followed when handling 500 lb and 1000 lb gas bombs containing hydrocyanic acid, phosgene or cyanogen chloride. Photographs and diagrams are included.

PB 36873. U. S. WAR DEPARTMENT. Ordnance maintenance: AA machine gun trainer M9. (Tech Manual 9-1221) Mar 1944. 201 p. Price: Microfilm-$5.00 - Photostat-$14.00
This manual contains instructions for inspection, disassembly, assembly, maintenance and repair of the trainer, supplementary to those in the field and technical manuals prepared for using arms. The M9 trainer consists of two guns, two units of sound equipment, one compressor and one target system. The guns are imitations of the cal. .50 water-cooled AA guns. Each gun is an electrically controlled pneumatic device for shooting plastic pellets on a 1:30 scale range to simulate time of flight under actual firing conditions. Battle sound effects are added. The target system for daylight operations consists of three miniature airplanes supported on steel wires. The equipment may be used for night training with the aid of a 250-watt ultraviolet lamp attached to the gun. Fluorescent pellets are shot in the path of light from the lamp. Numerous diagrams and photographs are included.

PB 36884. U. S. WAR DEPARTMENT. Ordnance maintenance: Data transmission system M5 (for 90-mm antiaircraft gun mount M1). (Tech Manual 9-1653) Oct 1942. 144 p. Price: Microfilm-$3.00 - Photostat-$10.00
This manual contains detailed instructions for inspection, disassembly, assembly, maintenance, and repair of the data transmission system. This system operates as one unit of the complete fire control equipment which includes a height finder and an AA. director. It transmits the director dial readings electrically to indicator dials on the separate gun mounts. Photographs, drawings, and diagrams are included.

PB 36889. U. S. WAR DEPARTMENT. Ordnance maintenance: Desiccation and charging of height finders. (Tech Manual 9-1622) Dec 1944. 40 p. Price: Microfilm - $1.00 - Photostat - $3.00
This manual contains a description of the apparatus (Including Helium Filling Kits M6A1 and M8) and instructions pertaining to testing, desiccating, and charging height finders with helium or nitrogen. Photographs and drawings are included.

PB 36892. U. S. WAR DEPARTMENT. Ordnance maintenance: Directors M5, M5A1, and M6. (Tech Manual 9-1659) May 1944. 294 p. Price: Microfilm-$6.00 - Photostat-$20.00
This manual contains detailed instructions for inspection, disassembly, assembly, maintenance, and repair of the directors which are used to direct fire on aerial targets and mechanized ground targets, particularly on low flying airplanes and dive bombers which fly within the minimum effective range of large antiaircraft guns. The manual is supplementary to TM9-659, describing operation, adjustment, and maintenance, normally performed by the using arms. Numerous photographs and drawings are included.

PB 36874. U. S. WAR DEPARTMENT. Ordnance maintenance: Fuze setter M9. (Tech Manual 9-1640) Sep 1941. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
The manual contains general descriptive matter and detailed instructions for maintenance and repair of the M9 fuze setter. This is a manually operated device used for setting the M2 time fuze on the fixed flashless HE shell M58, for 105-mm AA guns in accordance with fire-control data electrically transmitted by the M4 or M4A1 data transmission system. Photographs and drawings are included.

PB 36741. U. S. WAR DEPARTMENT. Ordnance maintenance: Fuze setter T15 (M13). (Tech Manual 9-1641) Oct 1941. 20 p. Available from the Supt. of Docs, Washington 25, D. C., 10¢.
This manual contains general descriptive matter and detailed instructions for maintenance and repair of the fuze setter, which is a manually operated device used for setting time fuzes of 90-mm antiaircraft gun ammunition in accordance with electrically transmitted fire-control data. Photographs and drawings are included.

PB 36893. U. S. WAR DEPARTMENT. Ordnance maintenance Remote control system M15 (for 40 mm gun carriages M2, M2A1). (Tech Manual 9-1678) Jul 1944. 322 p. Price: Microfilm - $5.00 - Photostat - $15.00
This manual contains detailed instructions for inspection, disassembly, assembly, maintenance, and repair of the remote control system, which is a hydraulic power system, electrically operated by the M5 directors, with electrical power supplied from the M5 generator unit. The M15 system continuously points the gun in both azimuth and elevation It consists of a gun junction box assembly, a contact ring assembly, a distribution box assembly, an elevation limit switch, an azimuth limit switch, an elevation switch two oil gears, and the necessary cable and plug assemblies . Photographs, drawings, and diagrams are included.

PB 36870. U. S. WAR DEPARTMENT. Ordnance maintenance: 75-mm gun M5 and airplane mount M9. (Tech Manual 9-1312) Apr 1944. 47 p. Price: Microfilm-$1.00 Photostat-$4.00
This manual contains detailed instructions for inspection, disassembly, assembly, maintenance, and repair of the 75-mm gun M5 and Airplane Mount M9, supplementary to those published in TM9-312. Photographs are included.

PB 37885. U. S. WAR DEPARTMENT. Organic field artillery air observation. (Field Manual 6-150) Aug 1944. 110 p. Price: Microfilm-$3.00 - Photostat-$8.00
This manual describes the training, tactical employment, administration, maintenance, and supply of organic field artillery air observation. It is intended to meet the needs of commanders of air observation personnel. Sketches and drawings are included.

PB 36222. U. S. WAR DEPARTMENT. Protector, facepiece E21R2. (Tech Bulletin CW 23) Nov 1944. 31 p. Price: Microfilm-$1.00 - Photostat-$3.00
One or more protectors are used to remove toxic gases and smokes from air and to supply purified air to personnel whose activities are confined to small areas. In such areas protectors my be more desirable than gas masks as they provide less resistance to breathing, increased vision, less weight on the head, and greater comfort especially when wearing headgear. Purfied air is blown through hose of the protectors to lightweight facepieces worn by personnel. Protectors may be installed in armored vehicles, trucks, trailers, and any other vehicles with power source capable of delivering the necessary amperage at 12-volt or 24-volt direct current. Protectors may be used for respiratory and facial gas protection of personnel in small areas which are not gas-proofed or wholly enclosed, such as field hospitals. This equipment may be used as a dust mask in the same manner as used for a gas protector. It may be used to replace goggles or a dusk mask because it is more comfortable to wear, and provides an efficient and long lasting dust separating system. Photographs are included.

PB 36223. U. S. WAR DEPARTMENT. Protectors, facepiece, E21R3 and E21R4. (Tech Bulletin CW 30) May 1945. 36 p. Price: Microfilm-$1.00 - Photostat-$3.00

This bulletin presents installation, operating, and maintenance instructions for the information and guidance of personnel using this equipment. The facepiece protectors M2IB3 and M2IB4 are modifications of the M2IB2 protector described in PB 36222. Photographs and diagrams are included.

PB 36871. U. S. WAR DEPARTMENT. Repositioning machine M15 (for cal. .50 cartridges). (Tech Manual 9-220) Jun 1945. 31 p. Price: Microfilm-$1.00 - Photostat-$3.00
This manual contains general descriptive matter and technical information required for the identification, use, and care of this machine. The M15 machine is a hand-operated device for repositioning cartridges which may become misalined or loose in link belts due to the shifting of links or the improper depth of cartridge insertion in links. A lubrication diagram and photographs are included.

PB 36888. U. S. WAR DEPARTMENT. 2-cm flakvierling 38 (German 20-cm antiaircraft gun, four-barreled mount) (Tech Manual E 9-228) Apr 1943. 115 p. Price: Microfilm-$3.00 - Photostat-$8.00
This manual consists of a translation and adaptation of the German Handbook D. (Luft) T. 1001, 2-cm Flakvierlinglafette, and supplementary information from other sources. In addition to a description of the 2-cm Flakvierling, this manual contains technical information required for the identification, use, and care of the material. Diagrams, photographs, a range table, and trajectory chart are included.

PB 37889. U. S. WAR DEPARTMENT. 37-mm gun, antitank, M3. (Field Manual 23-70) Nov 1942. 196 p. Price: Microfilm-$4.00 - Photostat-$14.00
This handbook contains general information and instructions for the training of military personnel in the operation and maintenance of this flat trajectory weapon of the field gun type. Photographs, drawings and sketches are included.

PB 37888. U. S. WAR DEPARTMENT. 60-mm mortar M2. (Field Manual 23-86) Nov 1942. 123 p. Price: Microfilm-$3.00 - Photostat-$9.00
This handbook contains general information and instructions for the training of military personnel in the operation and maintenance of this smooth bore, muzzle loading, high angle fire weapon. Photographs, drawings, and sketches are included.

PB 36894. U. S. WAR DEPARTMENT. Synchronizing. (Tech Manual 1-510) Mar 1943. 60 p. Price: Microfilm-$2.00 - Photostat-$4.00
This manual is intended to familiarize AAF armament personnel with the installation, maintenance, inspection, and operation of synchronizing equipment. "Synchronizing" as used in this manual means the mounting and adjusting of machine guns on an aircraft so that the guns may be fired through the plane of propeller rotation. Drawings and photographs are included.

PB 31685. WESTBROCK, A. J. and CORNELL, J. J. Seals, Bofors 40 mm gun, recoil cylinder packing ring. (Chrysler Corp Eng Div Tech Rept G-61806.12) Mar 1944. 28 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report contains the results of tests made to compare the durability of various sealing elements for the recoil cylinder packing ring of a Bofors 40 mm gun; to determine which type gives the best sealing quality in the range of temperature from -40° F to 150° F; to determine the force required to pull the piston rod through the recoil cylinder packing at various stages of abrasion; and to determine the effect and practicability of using fewer sealing elements - than the specified number. Seals of the original design and material proved most satisfactory. Illustrations, graphs and tables are included in the report.

PB 36906. WILSON, H. E. Test of rejected gas cylinder tubes C9079 for cal. .30 M1918A2 B.A.R. (Springfield Armory Eng Dept Tech Rept WO 322) Sep 1943. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
The test was made to determine whether the gas cylinder tubes for Browning Automatic Rifles, as represented by samples submitted for test would function satisfactorily. Results were unsatisfactory.

PB 30948. WILTON, tr. Ironless unipolar shock generator: Main subject, file of Otto Muck. Project XII. Feb 1945. (BIOS Halstead Exploiting Centre Rept 196) May 1946. 81 p. Price: Microfilm-$2.00 - Photostat-$4.00
This is a translation of a German report. It discusses the possibilities of this unipolar machine to propel high altitude electric A. A. guns. The generator is connected in series with an ironless linear motor having a low self induction per volt EMF. The bars are connected by an intermediate piece to facilitate sufficient freedom of movement between the generator and motor. To initiate the building up of a natural field, the motor requires an initial field to replace the magnetic remanence. This initial field is produced by the discharge of a condenser-shock battery. The report also suggests a method for increasing the energy of the propellant gases by electrical heating.

PB 37075. WOLLMAN, S. H. and others. The effect of confinement on underwater explosions. (NAVORD Explosives Res Rept 4) Apr 1944. 26 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report presents the results of an investigation into the effect of confinement on underwater materials, by means of determining the effect of variations in thickness, materials, and construction of the charge case on the peak pressure and momentum fields surrounding such explosions. The fragmentation of the case was also studied.

PB 31920. WOLLMAN, S. H. Underwater explosion pressure and momentum fields around two German warheads 97a. (NAVORD Explosives Res Memo 8) Jul 1944. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
Measurements were made at the U. S. Naval Mine Warfare Test Station Somomen's Island, Md. The 97A torpedo warhead is 88.9" long and 21" in diameter, containing 660 lbs. of block-loaded Hexanite. The warheads were initiated with boosters of the depth charge March 6. Measurements were made with crusher gages at 17 feet and 26.5 feet from the center of gravity of the warheads at angles of 0°, 45°, and 90° from the charge axis. There were four crusher gages at each position oriented for glancing incidence. A Hilliar gage was placed in the bottom of each of the gage blocks at 26.5 feet. Four momentum gages were placed at each of the above angles at a distance of 27.5 feet from the charge. Tabulated test data are included.

PACKING AND PACKAGING

PB 36781. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, INDIANA. Effect of storage on liveliness of tennis balls. (Rept 127) Apr 1945. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report deals with two factors: The rapidity with which tennis balls are affected during storage; and the effectiveness of storage under pressure in maintaining liveliness. Tests were conducted with six balls obtained from three different companies. Type "A" balls were pressure-packed in tin when received; types "B" and "C" were packaged in cardboard boxes. Types "A" and "B" were inflated with nitrogen, type "C" with air. It is concluded that tennis balls deteriorate rapidly when stored at atmospheric conditions, which deterioration is enhanced at elevated temperatures; balls packaged under pressure have good playing qualities just after removal from their container; balls which lose liveliness when exposed to the atmosphere can be maintained in good condition or improved by storage under 30 lbs. per sq. in. air pressure; tennis balls subject to storage in warm climates before use should be packaged under pressure to insure good playing qualities when placed in use; balls, nitrogen filled, resist aging to a greater extent than do those air filled. Appendix consists of tables and graphs.

PB 36748. U. S. WAR DEPARTMENT. Instruction guide: Ordnance packaging and shipping (posts, camps, and stations). (Tech Manual 9-2854) Feb 1945. 162 p. Available from the Supt. of Docs., Washington 25, D.C. 40¢
This manual presents simplified instructions for use in packaging and shipping ordnance general supplies at posts, camps, and stations, where available equipment and materials are limited. These instructions have been especially prepared so as to require as few materials as possible, and to outline operations that can be performed with hand tools and equipment. The instructions include cleaning and the application of corrosion preventives to material in preparation for packing, methods of inner packaging, construction of exterior shipping containers and skid units, identification and marking, and freight car and truck loading. Numerous illustrations are included.

PERSONNEL APTITUDE TESTING AND JOB TRAINING

PB 34831. ROSENTHAL, H. J. (tr.) The small reaction apparatus (Das klein - reaktionsgerät) (AAF T-2 Translation 752) Jun 1946. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00 (limited supply mimeograph 25¢)
This translation presents a description of the subject apparatus and of the testing procedure. The purpose of this apparatus is to make it possible to test the power of concentration and capacity of reaction during the selection of pilots, radio operators, range-finder operators, submarine sound locators, etc. Operating instructions, and table are included. Diagram showing plug connections for headphones and foot switch is also included.

PB 28987. U. S. BUREAU OF NAVAL PERSONNEL. STANDARD AND CURRICULUM DIV. Electrical schools: Circuit tracing and hook-up tests, class "A" NTSch (electrical), U.S. Naval Training Center, Great Lakes. Insert B, for manual or constructing and using achievement tests (NAVPERS 16808). (NAVPERS 16861). Nov 1944. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The test presented here is intended to determine the accuracy with which students trace out circuits and connect a slip ring induction motor to a magnetic across-the-line starter. Photographs show the equipment used in the tests.

PB 28989. U. S. BUREAU OF NAVAL PERSONNEL. STANDARDS AND CURRICULUM DIV. Radio technician training program. Practical workbook, elementary electricity and radio material. First, second and third months. (NAVPERS 16125B-D) Jan 1945. 117 p. Price: Microfilm-$3.00 - Photostat-$8.00
These three training manuals are intended for instruction of students in various phases of electronic principles. The student is taught to use voltmeters, ammeters and radio equipment. Simple circuits are constructed to illustrate electronic principles. Diagrams illustrate the lessons.

PB 28988. U. S. BUREAU OF NAVAL PERSONNEL. STANDARDS AND CURRICULUM DIV. Radio technician training program. Practical workbook, pre-radio material. (NAVPERS 16125A) Jan 1945. 29 p. Price: Microfilm-$1.00 - Photostat-$2.00
This is a workbook for students of the fundamentals of radio and includes practical work sheets to illustrate various techniques and skills required, together with basic electrical principles involved.

PB 37884. U. S. WAR DEPARTMENT. Coast defense. (Field Manual 31-10) Jul 1941. 54 p. Price: Microfilm-$2.00 - Photostat-$4.00
This manual describes doctrines and operations in the preparation for and the execution of coast defense, which includes all measures taken to provide protection against any form of attack at or near the shore line as well as within the combat zone immediately in rear thereof.

PB 37885. U. S. WAR DEPARTMENT. Desert operations. (Field Manual 31-25) Mar 1942. 72 p. Price: Microfilm-$2.00 - Photostat-$5.00
This manual suggests the more important factors and conditions which must be considered in preparation for desert operations. The information is based on the experience in the Western Desert in Africa and has been compiled from a study of reports, interviews with observers and all other sources of information available at the time of preparation. Photographs are included.

PB 37886. U. S. WAR DEPARTMENT. The firing battery. (Field Manual 6-140) Dec 1945. 249 p. Price: Microfilm-$5.00 - Photostat-$17.00
This manual describes the functions and detailed operations of the firing battery which is a component part of the gun (howitzer, rocket) battery, the basic fire unit of field artillery. The firing battery is made up of a headquarters, two or more gun sections, and an ammunition section. The manual is illustrated.

PB 36887. U. S. WAR DEPARTMENT. Handbook on the Italian military forces. (Tech Manual E 30-420) Aug 1943. 490 p. Price: Microfilm-$10.00 - Photostat-$33.00
The purpose of this handbook is to give U. S. military personnel a better understanding of the principal characteristics of the Italian Army. The book contains information on recruitment and mobilization, organization, supply and transportation, ranks, uniforms, and insignia and armament and equipment. A discussion of the Italian Air Force is included as well as sections on tactics permanent fortifications, and camouflage. This handbook contains almost two hundred illustrations.

PB 36974. U. S. WAR DEPARTMENT. Orientation for artillery (with Changes No. 1-2, Nov 1944-Feb 1945) (Tech Manual 44-225) Jun 1944. Price: Available from the Supt. of Docs., Washington 25, D. C. - 40¢.
273 p.
This manual prepared for reconnaissance officers, presents the methods of solution of the problems of ascertaining direction, including the location of points in both a horizontal and vertical direction, and the establishment of lines of known length and azimuth. Since the methods of solution of orientation problems are dependent upon the time available for the solution and the equipment at hand, this manual gives both quick, approximate methods and more lengthy, precise methods. There are chapters on elementary astronomy, stellar observation, solar observation and star identification. The manual is fully illustrated. Charts and tables are appended.

PHOTOGRAPHIC AND OPTICAL GOODS (INCLUDING PHOTOGRAPHIC PROCESSING)

PB 32587. HINKEL, G. A. The Aluna process. (FIAT Final Rept 812) Jun 1946. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report describes a method of making diazo types (osalid prints) by first photoprinting on a special transparent reproduction material called Aluna through either reflex copying or projection printing to obtain a negative. The negative is then converted to a positive to serve as a new intermediate original. This process makes it possible to obtain highly intensified reproductions of pencil drawings and old weak originals. To make the Aluna stock, the transparent paper is coated with a nitrocellulose lacquer on one side, dried, and a substratum superimposed on the lacquered surface. For Aluna Kontakt, a sensitized silver bromide is then applied. Aluna Kontakt T makes use of a silver chloride emulsion instead. Especially mentioned are Kalle & Co., A. G., and Felix Schöller Co. at Burg Gretsch, Osnabrück.

PB 34055. LEVESQUE, H. J. and VIGO, S. Present methods for spectrographic analysis at Watertown Arsenal. (Watertown Arsenal Lab Rept 122/29) Jun 1945.
23 p. Price: Microfilm-$1.00 - Photostat-$2.00
The object of this report is to describe and make a permanent record of the practice of spectographic analysis developed to date at Watertown Arsenal. The apparatus in use, consisting of two 3-meter grating spectrographs, two nonrecording densitometers, and accessories, is described. Data for the use of this apparatus in determining the contents of various metallic elements in steel are given in detail. The application of the spectrograph to qualitative analysis of miscellaneous materials is also described. A brief account is given of development work in progress using additional equipment or methods which vary from present standard practice. This work will be covered in detail in a subsequent report. A bibliography and tables are included.

PB 36851. PACKER, DONALD M. Binocular photometer: A portable instrument for measuring transmissions of coated binoculars. (Naval Gun Factory Optical Lab Tech Rept 01-44) Jun 1944. 33 p. Price: Microfilm-$1.00 - Photostat-$3.00
Binocular optics in current production are routinely coated with reflection-reducing films to increase the light transmission of the instruments. In order to maintain control of the quality of the coatings, it was deemed advisable to establish a minimum value for the transmission of filmed binoculars. Based upon measurements of a limited number of instruments, the figure of 76 percent has been generally agreed upon as representing a fair value for the minimum transmission of one barrel of a coated binocular. A survey revealed that the equipment available for the measurement of transmission factors of telescopic instruments was not readily adaptable to routine inspection for compliance with this specification. The Naval Gun Factory was therefore requested to design a compact, portable, simply operated instrument suitable for the measurement of coated binoculars. The binocular photometer described in this report represents the Naval Gun Factory's interpretation of the solution to the problem presented. Instructions for its construction, operation and maintenance are given. Appendix lists the parts to be obtained commercially for one instrument, together with manufacturers' names. Appendix also presents analysis of the measuring circuit, and information on other uses of the binocular photometer. Tables, photographs, graph, schematic and wiring diagrams are included.

PB 34776. RULE, B. H. Optical method of measuring angular changes of projectile modal during entry phase. (OSRD Rept 2430; Calif Institute of Technology Rept IPC 69) Mar 1945. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
The report describes the "Optical Whip Recorder", intended for use in modal studies of the water entry of torpedoes or bombs. It enables the yaw and pitch angles of the specimen during entry to be measured with an error of less than 0.01 degree and at time intervals of about 10^{-4} sec. (Roll may also be measured if desired). The present whip recorder is designed to resolve the angular changes that occur during the first bomb-length of travel after impact. It makes single plate records of entry angles for 1-inch diameter models, and consists briefly of an optical system to record the modal angles by reflection of an interrupted light beam onto a photographic plate. Diagrams and photographs are included.

PB 34821. RUMEL, D. E. German gun camera, MBK-1000B. (AAF AMC Eng Div Memo Rept TSEPT-447-5) Jul 1946. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The report contains the evaluation results of this captured German camera, which is a 35 mm magazine loading camera flexibility installed. It simulates a machine gun in shape, size, and operation, and serves for the recording of fire on ground and air targets. It has a pistol grip on the stock and a trigger for releasing the mechanism which simulates the releasing of the machine gun bolt after placing the ammunition container on the gun. The camera is also fired by the trigger which is located in the trigger guard in front of the pistol grip. It is concluded that no novel or usable features are incorporated in the MBK camera which are usable on motion picture or gun cameras but that some features may be applicable for recording cameras. Five photographs are included.

PB 36021. U. S. BUREAU OF ORDNANCE. Optics filming. (NAVORD Pamphlet 1612) Dec 1945. 130 p. Price: Microfilm-$3.00 - Photostat-$9.00
This pamphlet describes the authorized procedure for applying reflection-reducing films of magnesium fluoride by the high vacuum technique on glass surfaces. The pamphlet recommends the filming of all fire control and lookout optical instruments in which there are more than four air-glass surfaces (two lenses). The pamphlet contains information relative to the installation, operation, and maintenance of Optics Filming Units Marks through 6. The pamphlet contains a brief history of coating optical surfaces with evaporated films and a discussion of the theory of reflection-reducing films. Photographs, curves, drawings, and schematic diagrams illustrate the publication.

PB 36009. U. S. BUREAU OF ORDNANCE. Plate glass for optical instruments. (NAVORD Specification 1076) Mar 1942. 3 p. Price: Microfilm - $1.00 - Photostat - $1.00
These specifications from the U. S. Naval Gun Factory on the procurement of high grade plate glass for windows in optical instruments include requirements as to materials and workmanship, size of plates, freedom from bubbles, seeds, surface defects, and striae, methods of inspection and packing. A diagram showing projection method for inspection of striae is appended.

PB 36006. U. S. BUREAU OF ORDNANCE. Reflection-reducing films produced by the evaporation process. (NAVORD Specification 1357) Nov 1942. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00
The purpose of these specifications is to provide suitable standards of quality and performance for evaporated metallic fluoride or other similar films which may be applied to light transmitting surfaces in order to improve the quality of optical images by reducing reflections from, and increasing transmission through, optical elements. These specifications apply to visual and general photographic instruments only; They are not to be construed as applying to instruments designed for light of wavelengths substantially different from those of the visual spectrum. The only reflection-reducing film included in these specifications is the metallic fluoride type produced by evaporation in a high vacuum. These specifications do not include films produced by chemical leaching, acid etching or by any means other than evaporation. General and detail requirements and methods of inspection are specified.

PB 36008. U. S. BUREAU OF ORDNANCE. Slabs and molded shapes of optical glass. (NAVORD Specification 1316) Sep 1943. 4 p. Price: Microfilm - $1.00 - Photostat - $1.00
This specification covers slabs and molded shapes of borosilicate, barium and ordinary crown, bary ta flint, flint, medium flint and dense flint optical glass, with specified characteristics, used in the manufacture of certain Ordnance optical instruments. Data to be furnished by manufacturer and other requirements, methods of inspection, tests, etc. are outlined.

PB 36801. U.S. BUREAU OF ORDNANCE. 12-power binoculars, Mark XIII. (NAVORD Specification 3341). Oct 1923. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
Optical characteristics of binoculars submitted under these specifications shall be as follows: Magnification, 12 diameters plus or minus 5 percent; true field, not less than 3° 20'; exit pupil, not less than 3.5 mm. in diameter at center of the field and not less than 1.5 mm. in minimum dimension at the edge of the field; eye distance, not less than 10.5 mm.; light transmission, not less than 50 percent. One or two sheets of this specification may not reproduce well.

PB 34117. U. S. NATIONAL DEFENSE RESEARCH COMMITTEE. Comparative study of internal adjuster targets of range- and height finders. Report to the services No. 89: Div. 7, Fire Control. (OSRD Rept 2051) Nov 1943. 46 p. Price: Microfilm-$1.00 - Photostat-$4.00
As part of a study for the development of short base range-finders, laboratory tests were made at Brown University to determine the relative consistency and precision obtainable by observers with a number of patterns of internal adjustment targets. Five documents, describing the experiments, are attached to this report. These are: Progress Report No. 13, "An analysis of the precision and subject variation of range corrector settings for small monocular range finders"; Progress Report No. 16, "The effect of illumination on the precision of range corrector settings for small monocular range finders"; Progress Report No. 17, "The precision of monocular range corrector settings with a pattern of vertical lines, studied as a function of the separation between lines"; Report No. 1, "A stereo-micrometer device for precision measurements of stereoscopic and vernier

acuities"; and Report No. 2, "A comparison of various visual patterns for use in connection with the internal adjuster system of a range finder." Results of these tests indicated that for monocular rangefinders, particularly of the short base type, the adoption of an internal adjuster pattern which involves setting a fiducial line midway between two target lines is desirable. Diagrams, curves, and tables illustrate the attached reports.

PB 34132. U. S. NATIONAL DEFENSE RESEARCH COMMITTEE. The influence of atmospheric scattering in range finding. Report to the services no. 36: Sect. D-2, Fire Control. (OSRD Rept 930) Oct 1942. 123 p. Price: Microfilm-$3.00 - Photostat-$9.00

This report describes the series of experiments carried out at Ohio State University analyzing the effects of atmospheric obscuration on stereoscopic settings. Three aspects of haze were studied, including loss of contrast of target with background, blurring of target outline, and the chromatic difference of target and reticle backgrounds. This report is concerned with the aspects of relative contrast and blurring of target outline, and is divided into two parts. The first is "The influence of atmospheric scattering in range finding" and it describes experiments to determine the extent of discrepancy between the true range and the range setting of the M1 height finder because of atmospheric conditions. The principal effect of light scattered by the atmosphere is to reduce the contrast between the target and its background. The discrepancy occurring when the contrast of a target is reduced increases in a definite and predictable manner. Recommendations for compensating possible errors are made. Part II, "Effect of atmospheric scattering upon the appearance of a dark object", by G. A. Fry and C. S. Bridgman, develops a theory of the effect of atmospheric scattering and absorption of light by the atmosphere and the effects upon the appearance of an object against a sky background. Diagrams and curves illustrate the report.

PB 36762. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, INDIANA. The relation between lens height of glasses, sun, M-1944, and adaptability to various facial types. (Rept 148) Apr 1945. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00

The standard model glasses, sun, M-1944 as described in specification J.Q.D. 597 were found to be somewhat annoying to some persons because the brow bar interferes with the field of vision. Owing to varying facial characteristics, the entire assembly rides lower on the face of these persons. In an effort to alleviate this, experimental sets of sunglasses with varying heights of lenses were examined in order to ascertain which model would be the most suitable to the greatest number of wearers. It is concluded that the annoyance caused to many persons by the brow bar of the standard model sunglass is largely eliminated by increasing the height of the lens 3/16 inch or more, the nose piece becomes gradually more evident as the lens height is increased; there is a definite ratio for the samples examined between the lens height and field of vision - an increase in height of 1/8 inch adds four percent to the field of vision, an increase of 1/4 inch adds eight percent to the field of vision; the standard model and the three modifications examined in this report exhibited equal characteristics as regards comfort, fit and other properties associated with the wearing of the item. Photographs, tables and graphs are included.

PB 36863. U.S. WAR DEPARTMENT. Camera PH-274. (Tech Manual 11-2386). Feb 1946. 106 p. Price: Microfilm-$3.00 - Photostat-$8.00

Subject item is a 35-millimeter motion picture camera with accessories, designed for studio and field production work. It is driven by a motor to which power is supplied by a 12-volt storage battery. It is not entirely silent in operation but, as the alternate gears are fiber, it is silent enough to be used with double-system sound recording provided the microphone is not placed too near the camera, and provided the camera is encased in the barney supplied. Camera PH-274 includes all accessories necessary for photographing silent pictures, as well as those required to adapt it for use with a sound recorder. List of components are given. Operating, maintenance and repair instructions are also given. Name of maintenance part, description and Signal Corps stock No., are tabulated in the appendice. Facsimiles of War Departments lubrication orders are also shown. Photographs are included.

PB 36726. U. S. WAR DEPARTMENT. Height finders, 13½-ft., M1 and M1A1 (with Changes no. 1, May 1945). (Tech Manual 9-623) Nov 1943. 148 p. Price: Microfilm-$3.00 - Photostat-$10.00

This manual contains general descriptive matter and detailed instructions for the emplacement, adjustment, test, operation, and care of the 13½-ft., heightfinders M1 and M1A1. It is normally used in an antiaircraft battery to determine the slant range or the altitude of an aircraft target designated by the director in the battery and to transmit continuously this data to the director. It employs the stereoscopic principle of rangefinding. Photographs, diagrams, and drawings show the appearance of the materiel and the location of the controls. Data on weight, dimensions, and operating limits are included.

PB 36727. U. S. WAR DEPARTMENT. Height finders, 13½-ft., M2 and M2A1 (with Changes no. 1, Apr 1945). (Tech Manual 9-624) Nov 1943. 138 p. Price: Microfilm-$3.00 - Photostat-$10.00

This manual contains general descriptive matter and detailed instructions for the emplacement, adjustment, test, operation, and care of the 13½-ft. heightfinders M2 and M2A1. The equipment uses stereoscopic rangefinding principles for determining the slant range of altitude of an aircraft target. Photographs and drawings show the appearance of the materiel and the location of the controls. Data on weight, dimensions, and operating limits are included. The equipment is similar to the M1 heightfinder (described in PB-36728) in optical characteristics but varies in construction details.

PB 20476. WALTNITZKI, G. Progress report on microphotography research. (Reichsforschungsrat) (ALSOS Mission, RFR 101) Jul 1938. 5 p. Price: Microfilm-50¢ - Photostat-$1.00

The author reports briefly on experiments made with various types of films and photographic emulsions for the purpose of determining (a) the resolving power of commercial fine-grain films in the re-enlargement of photographic reductions; (b) the ratio of reduction that can be obtained with the lenses of the modern candid cameras and commercial fine grain film; and (3) the scale of reduction obtainable with the aid of suitable micro-optical system, and special photographic emulsions. In German. This work was done at the Kaiser Wilhelm Institut für Physikalische Chemie und Elektrochemie.

PB 36850. ZOOK, M. ALVA, JR. Non-metallic semi-reflecting films: A description of the performance and production of high efficiency half tone coatings for optical instruments. (Naval Gun Factory Optical Lab Tech Rept 07-45). Jun 1945. 26 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report is a preliminary discussion of nonmetallic reflectors. The purpose is to furnish the fundamental knowledge necessary for production and use of these films. Transparent reflecting surfaces, referred to as half-tones or semi-reflectors, are frequently used in optical instruments. In the past, half-tones consisted of layers of metal such as silver, aluminum, platinum, rhodium, chromium, gold, or copper. These half-tones have the disadvantage of absorbing 20 to 40 percent of the light. This loss of light is especially detrimental in any instrument that is used in dim light or semi-darkness. The chief advantage of the nonmetallic semireflector is, therefore, that it eliminates this loss of light caused by absorption in the film. The reflection and transmission of light by the nonmetallic half-tone always add up to 100 percent, less losses in other parts of the prism; therefore, it is necessary only to refer to the reflectance when discussing the optical properties of the films. Any desired reflectance below 55 percent can be obtained with a coating of this type, within the limitations imposed by angle of incidence, polarization, and color. Appendix outlines procedure for removing zinc sulfide films and cryolite. Graphs and drawings are included.

PHYSICS

PB 32180. BOHNENBLUST, H. F. Comments on White and Griffis' theory of the permanent strain in a uniform bar due to longitudinal impact. (NDRC Memo A-47M; OSRD Rept 781) Aug 1942. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
This memorandum presents a mathematical solution of the problem of the effect of a sudden impact on the permanent strain in a uniform bar which varies from that of White and Griffis (see PB 18480, abstracted in v. 1, p. 1414). However, the results proved to be identical. The author avoids the assumptions that the shock wave induced by the sudden unloading at the end of impact travels with a velocity C_0, and that after the passage of the shock wave, the bar is left in such a condition that the waves in it are all elastic.

PB 27715. ROTHE, W. Die mindestgrösse der U-maschine (Auszug) (The minimum size of the U-machine. An extract). n. d. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
This mathematical computation deals with the splitting of the uranium atom and gives Fermis law for thermionic neutrons. No indication of the source of this extract is given.

PB 36955. BROWN, RICHARD H. Tables to facilitate the analysis of sensitivity data. (NAVORD Rept 205-45) Sep 1945. 15 p. Price: Microfilm-$1.00 - Photostat-$1.00
The maximum likelihood method for estimating parameters is outlined and the proper use of the tables is suggested. A short list of references is given.

PB 33399. DIETZE, H. Absorption of coated steel plates. (NDRC Rept 6.1-2146) Apr 1945. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report describes tests made by the Columbia University Underwater Sound Laboratory on three coated steel plates. Measurements were made at the Mountain Lakes test station. These measurements were made in the high pressure tank in order to investigate the effect of hydrostatic pressure on the absorptive properties of these panels. All panels used were of the same size and material, namely 14 inch square by 5/8 inch thick steel. The tests consisted in measuring the reflections from the panel received by the hydrophone and compare them with those from a bare steel plate panel of the same dimensions placed at the same distance, using the regular pulsing system. The absorption material in its present state of development was found not to be suitable for use in pressure tanks. It affords, however, a ready means for obtaining 10 to 15 decibels absorption at atmospheric pressure. The results of the measurements are shown in three graphs.

PB 30952. DOERING, W. The oscillations of the gas bubble, resulting from an under-water explosion and the distribution of pressure in its neighbourhood. Jan 1943. (BIOS Halstead Exploiting Centre Rept 213) May 1946. 31 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report from the Institute of Theoretical Physics of the University of Göttingen contains calculations on the distribution of pressure in the surroundings of a sphere of a high explosive detonating in water. Calculations are made with the aid of an expansion method on the assumption that the water has a modulus of compression independent of the pressure. The method of approximation assumes that the pressures which occur are small compared with the modulus of compression. From this is derived the differential equation for the pulsation of the gas bubble generated by the high explosive, in the form of an expansion of series in powers of the reciprocal velocity of sound in water. The relation of the radius of the gas bubble to the time as well as the appropriate distribution of pressure have been numerically calculated for an example and compared with the experiment. Graphs are appended and a bibliography of seven items is included in footnotes.

PB 37077. FINKELSTEIN, R. The normal reflection of a shock wave. (NAVORD Explosives Res Rept 6) Aug 1944. 41 p. Price: Microfilm-$1.00 - Photostat-$3.00
In this report normal reflection from a rigid surface is considered, based on the fact that when a shock collides with a structure, the resulting damage depends upon the duration of the blow as well as upon the initial pressure due to it. An analytical method is used to find pressure-time curves at a reflecting surface in air as well as in other gases and in water (going beyond acoustic theory). The pressure-time curve at a wall is described by three characteristics namely: (1) its peak pressure, (2) its curvature, and (3) its duration. In this report it is found that the correct theoretical pressure-time curves at the wall are, in typical fluids, concave upward more strongly than their acoustic approximations. However, gases and water are here found to behave differently. In gases the blow is prolonged and the impulse delivered to a rigid wall exceeds the value predicted by acoustic theory. In water the blow is shorter and the impulse is less than one would expect from the acoustic approximation. Results of this report may be applied to current damage theories to estimate errors introduced by use of the acoustic approximation. These errors may be very large if the target is close to the charge (e. g., contact mine, torpedo, depth charge, or a near-miss bomb), although they may be negligible if the target is attacked by a distant charge, such as one in an influence mine. Pressure-time curves are included.

PB 19673. GERMANY. REICHSFORSCHUNGSRAT. Bericht über die Besprechung des Arbeitskreises "Ferromagnetismus" im Reichsforschungsrat am 28. und 29. April 1944 in München (Report of the conference of the work group "Ferro-magnetism" of the Reichsforschungsrat, 28-29 April 1944). (ALSOS Mission, Gerlach 8) Apr 1944. 19 p. Price: Microfilm-50¢ - Photostat-$2.00

The minutes of the meeting of the group "Ferromagnetism", of the Reichsforschungsrat, which took place in Berlin 28-29 April 1944 are presented. The names of the members of the group are given, along with their official positions and their responsibilities within the organization. The subjects discussed at the meeting included a definition of the duties and responsibilities of this division in relation to the Reichsforschungsrat; a report from each member as to the effect of enemy air raids on the various installations throughout Germany; a brief statement as to the present status of the research projects undertaken; and a statement as to the most urgent projects in progress. In German.

PB 31012. GREEN, H. C. JR. Description of the equipment used in the measurement of underwater acoustic transients. (OSRD Rept 4515; NDRC Rept 6.1 1978) Dec 1944. 15 p. Price: Microfilm-$1.00 - Photostat-$1.00

This report describes the equipment used by the Underwater Sound Reference Laboratories, Division of War Research, Columbia University, in connection with tests on explosive sounds which were made at the Mountain Lakes test station. The equipment consisted of a transducer to convert the desired transient into a voltage wave, and the electrical and recording systems. Oscilloscope traces were photographed using a high speed motion picture camera. An Xs x hydrophone head and a two stage amplifier were used. Schematic diagrams are included.

PB 31020. HOFF, H. B. and others. Oceanographic studies. Summary report. (OSRD Rept 5207; NDRC Rept 6.1 1933) May 1945. 29 p. Price: Microfilm-$1.00 - Photostat-$2.00

This report summarizes the oceanographic work done by members of the Underwater Sound Laboratory, Division of War Research, Columbia University, at Fort Trumbull, New London, Conn., from its inception to the end of 1944. Most of this work was done by the Oceanographic Group in the Analysis Department after it had been found impracticable for each development department to handle its own oceanographic requirements. Thus, in nearly all of its activities, this group has operated as a technical service unit. New London Laboratory projects in which oceanography has been of importance were: merchant vessel protection, underwater telephony, echo-ranging, triangulation listening ranging (TLR) from submarines, the DCDI (above-below indication and range estimation). Some details of the oceanographic techniques used are given, and are followed by a discussion of their applications to some of the above-mentioned projects. A list of references, map and graphs are included.

PB 37082. KENNA, P. C. and SEEGER, R. J. Analysis of data on shock intersections. Progress report I. (NAVORD Explosives Res Rept 16) Feb 1944. 33 p. Price: Microfilm-$1.00 - Photostat-$3.00

This report contains an analysis of various experimental data to date on shock intersections in air; the analysis has been made jointly with J. von Neumann. Reflections of shocks from a rigid wall and collisions of shocks in a wind-tunnel are considered. The theory that pressures produced by oblique impact of a shock wave (blast wave) in air or in water may greatly exceed those obtained by head-on impact of the same shock is confirmed so that one may infer the predicted higher-than-head-on pressures. Characteristics of Mach reflection, which occurs near glancing angles of incidence, are presented and suggestions for future experimental investigations are given. There are several uses of explosives for which the angle of impact of the blast wave could be controlled so that this possible advantage of oblique impact would be significant. It plays an essential role in the use of proximity fuses and is relevant in connection with shaped charges. Photographs are included.

PB 14478. KRAFT, INGEBORG and GEPPERT, HAROLD Beitrage zur beugung elektrischer wellen an meereswellen (Contributions to the refraction of electrical waves by ocean waves). (ALSOS MISSION, Klotter file 7a) Dec 1944. 46 p. Price: Microfilm-50¢ - Photostat-$4.00

The mathematical institute of the university Berlin by order of the German communication engineering headquarters prepared this study for the calculation of the refraction of a radio beam of less than 5° elevation caused by ocean waves and the influence of the moving waves upon the fieldstrength at the point of reception below the horizon. In German.

PB 31014. LANGMUIR, I. and others. A study of binaural perception of the direction of a sound source. (NDRC Rept 6.1 1840; OSRD Rept 4079) Jun 1944. 56 p. Price: Microfilm-$2.00 - Photostat-$4.00

Apparatus is described which permits laboratory study of the binaural sense. With two acoustical compensators in series the importance of differences as little as 20 micro-seconds in time of arrival of sound at our ears was demonstrated and measured. A null circuit is shown which not only gives better accuracy than may be expected from the normal binaural shift method, but also permits development of a visual or recording type of indicator. This binaural equipment made it possible for a listener to hear two sounds in the receivers simultaneously, one directional, whose apparent direction could be controlled, the other non-directional. Intensities of the sounds were measured at the headset receivers with a sound level meter calibrated directly in decibels above the standard reference level of 10^{-16} watts per square centimeter. Tables, graphs, photographs and schematic diagram are included. This report is from the General Electric Research Laboratory.

PB 31917. MINORSKY, N. Introduction to non-linear mechanics: Part III. Non-linear resonance. (For Parts I-II see PB 23639 - 23640 v.2, p. 544). (David W. Taylor Model Basin Rept 558) May 1946. 136 p. Price: Microfilm-$3.00 - Photostat-$10.00

This third part of the report on non-linear mechanics deals with the complicated phenomena of non-linear resonance with its numerous ramifications such as internal and external subharmonic resonance, entrainment of frequency, parametric excitation, and the like. The first four chapters are devoted to an exposition of the quasi-linear theory of Kryloff and Bogoliuboff and the study is more or less equally divided between the phenomena of internal and external

resonance. The last three chapters give an outline of the work done by the school of Mandelstam and Papalexi and centers mainly about the phenomena of external resonance. They are illustrated by numberous experimental researches. A bibliography is included.

PB 37079. NEUMANN, JOHN VON. Oblique reflection of shocks. (NAVORD Explosives Res Rept 12) Oct 1943. 78 p. Price: Microfilm-$2.00 - Photostat-$6.00
This report contains a systematic study of the pressures which are produced when a shock (pressure) wave collides with an oblique obstacle. The investigation is part theoretical and part experimental, representing only a beginning of this study. The results obtained to date have determined that ordinary reflection gives way to more complicated forms of reflection, if the oblique reflection is nearly glancing. The highest reflection pressure obtains not when a shock is reflected head-on, but under certain oblique angles, which are nearly glancing for weak shocks. Thus in air a shock of 0.01 atm. overpressure produces in head-on reflection a total overpressure of 0.02 atm. but at 10° from glancing incidence it produces 0.03 atm. In water a 40 atm. shock produces 80 atm. head-on, but 120 atm. at 10° from glancing incidence. Data tables are included.

PB 31105. OSBORNE, M.F.M. Experiments with an electrically heated wire in a liquid. n. d. 31 p. Price: Microfilm-$1.00 - Photostat-$3.00
The properties of an electrically heated wire in various liquids have been investigated in an effort to explain qualitatively the properties of the hot-wire sound generator. The sound from the hot wire is primarily a cavitation noise - its properties can all be ascribed to the continous formation and collapse of vapor cavities. Many of the phenomena of cavitation including corrosion have a counterpart in boiling. It is shown that under certain conditions the hot wire has two stable forms of operation for the same input power. In one the wire is relatively cold and the sound emitted has a broad frequency distribution. In the other, the wire is red hot, and for some liquids the sound emitted is a single pure tone, a whistle of 1000-2000 cycles/sec. Swishing the wire through the liquid increases the intensity of this whistle. List of references, oscillograms and graphs are included.

PB 33106. PEKERIS, C. L. Theory of propagation of sound in a half-space of variable sound velocity under conditions of formation of a shadow zone. n.d. 52 p. Price: Microfilm - $2.00 - Photostat - $4.00
This report prepared by the Columbia University Mathematical Physics Group, treats the propagation of sound from a point source situated at some depth below the surface of a half-space in which the sound velocity decreases with depth. The chief interest is in the intensity of the diffracted radiation that penetrates into the shadow zone and its dependence on distance from source and on frequency. A detailed study is made of propagation of sound in a medium in which sound velocity decreases at a constant rate with depth. The solution inside the shadow zone is given in terms of normal modes. It is shown that in the case of explosive sound the travel time for a point in the shadow zone is such as to indicate that part of the trajectory is covered near the surface with the surficial sound velocity. Details are given for computing the pressure time curve in case of an exponentially decaying pulse at the source. The general theory of propagation of sound in media with arbitrary vertical variation of sound velocity is developed from the standpoint of normal modes and asymptotic solutions.

PB 37081. POLACHEK, H. and SEEGER, R. J. Interaction of shock-waves in water-like substances. (NAVORD Explosives Res Rept 14) Aug 1944. 111 p. Price: Microfilm-$3.00 - Photostat-$8.00
This report deals primarily with the reflection of plane shock-waves in water-like substances. It is shown that in the case of water the pressure for any oblique, "regular" reflection of a given shock is greater than that for head-on reflection. A complete set of graphs for quantities involved in regular reflection is furnished for γ, the adiabatic exponent, equal to 7.15 for water and 2.00 (also certain ones for $\gamma = 1.40$ for comparison with the Rankin-Hugoniot values). For convenience there are included essential formulae and tables of various functions used in the discussion of the propagation of plane shock-waves in water-like substances with $\gamma = 7.15$ and 2.00. To complete the theoretical discussion the one-dimensional interaction of shock-waves and rarefaction-waves has been considered, as well as the so-called "simple" theory of three-shock intersections. Graphs of the parameters needed to specify three-shock configurations in water are given. There is included a brief survey of the experimental work done to date at Oxford, England; at the David Taylor Model Basin, Carderock; at the Explosives Research Laboratory, Bruceton; and at the Underwater Explosives Research Laboratory, Woods Hole. Photographs are included.

PB 31022. PROUDFOOT, D. A. and HOFF, H. B. Ambient noise survey, Miami area. (First four cruises to Bahamas, Cay Sal Bank, and East Coast of Florida) (For supplement see PB 31023; for completion report see PB 31024) Aug 1943. 36 p. Price: Microfilm-$1.00 - Photostat-$3.00
During the period from June 27 to August 9, 1943, the Columbia University Division of War Research at the U. S. Navy Underwater Sound Laboratory, New London, Connecticut, with the cooperation of the San Diego Laboratory, EmOrd, and the Naval Ordnance Laboratory engaged in a program of ambient noise measurements in the waters adjacent to Florida and the Bahama Islands. In making the acoustical measurements two hydrophones were used. The field measurements (taken in overlapping octave bands at frequencies up to 2400 to 4800 cps and in a 500 cps band above this value) have all been reduced to sound pressure level per cycle (spectrum level) in accordance with standard acoustical practices. Virtually all of the measurements were made by recording the sound levels in the various filter bands on a Sound Apparatus Co. graphic level recorder having a writing speed of 45-50 db/sec. Tables and graphs are included.

PB 31026. SPITZER, LYMAN, JR. Acoustic properties of gas bubbles in a liquid. (OSRD Rept 1705; NDRC Rept 6.1 918) Jul 1943. 80 p. Price: Microfilm-$2.00 - Photostat-$6.00
Accumulating evidence indicates that the scattering and absorption of sound by small gas bubbles in water can constitute a serious difficulty in echo ranging or in listening. Work in connection with both the wake and reverberation pro-

grass indicates that a study of the acoustic properties of small bubbles is necessary for a complete understanding of the transmission of sound in sea water. In addition, air bubbles are apparently the most efficient absorbers of underwater sound and are, therefore, of interest in all cases where an absorbing sound screen would be useful. The present report from the Division of War Research, Columbia University, is intended primarily for the use of research workers in underwater acoustics and attempts to summarize and bring together in one place all relevant information on the acoustic properties of gas bubbles. Graphs and a list of references are included.

PB 18211. WEIZEL, WALTER. Der funke: Zwischenbericht des Institutes für theoretische Physik der Universität Bonn in Hildburghausen. (The spark: Intermediate report of the institute for theoretical physics of the University Bonn at Hildburghausen) (ALSOS Mission, Gerlach IV A2) Feb 1945. 25 p. Price: Microfilm - 50¢ - Photostat - $2.00
This study is a part of a comprehensive analysis of the electrical spark which is based upon research by the author in accordance to an introductional letter. The study contains paragraphs dealing with the arcing, the spark with self-induction and the afterglowing of arcs. Graphs appended. In German.

PRINTING, PUBLISHING, AND ALLIED INDUSTRIES

PB 39408. U. S. WAR DEPARTMENT. Records administration: Microfilming of records. (Tech Manual 12-267) Mar 1946. 94 p. Price: Microfilm-$2.00 - Photostat-$7.00
The purpose of this manual is to state the policy for microfilming records, the considerations which form the basis of approval and disapproval of proposed microfilming projects, and the manner in which approved projects are operated. Its aim is to encourage proper and economical utilization of microphotography in record keeping and to discourage uneconomical projects, undertaken without adequate understanding of microfilm's disadvantages and costs. It is divided into three chapters: (1) Uses and limitations of microfilm, (2) basic operating procedures for microfilming projects, and (3) special techniques. Chapter 3 has sections devoted to item system of numbering, decimal files, index card files, engineering drawings and microfilming of books. Camera operator's guide and film inspection guide are presented in appendices I and II. Drawings, forms, flow chart, graphs, diagrams and illustrations of film defects are included.

RUBBER AND RUBBER PRODUCTS

PB 36156. KÜCH, W. and TELSCHOW, G. Das verhalten von gummi bei tiefen temperaturen. (The behavior of rubber at low temperatures.) (Deutsche Luftfahrtforschung FB 1369) Apr 1941. 35 p. Price: Microfilm - $1.00-Photostat - $3.00
This report from the "Institut für Werkstofforschung der Deutschen Versuchsanstalt für Luftfahrt E.V." discusses the elastic properties of a number of commercially known, as well as of new, rubber compounds on the basis of tests involving temperatures down to -70°C. It is found that certain Buna-S compounds are more cold resistant than natural rubber. Graphs and tables.

PB 19440. MASSING. Gummimanschetten (Rubber sleeves for oil drills and pumps). (Reichsforschungsrat) (ALSOS Mission, HVR 507 39) Oct 1944. 8 p. Price: Microfilm - 50¢ - Photostat - $1.00
The author tested three types of buna rubber used as natural rubber substitutes for oil drill stems and piston sleeves, manufactured by Continental Gummi-Werke A.G., Hanover, and found that, while the type FOX 18 was more effective the type ZUZ 18 was, in general, to be preferred because of its lower cost and greater availability. Three diagrams are given showing pistons, and position of the sleeves; a fourth chart shows the results of the author's comparative studies of the buna substitutes. In German.

PB 36066. U. S. BUREAU OF ORDNANCE. Ebonite tubing. (NAVORD Specification 849) Jul 1941. 2 p. Price: Microfilm - $1.00 - Photostat - $1.00
This specification covers ebonite tubing with a 330 outside diameter, wall thickness of 90 mils, in lengths of not less than three feet and dielectric strength of not less than 100 volts per mil thickness of wall.

PB 36101. U. S. BUREAU OF ORDNANCE. Synthetic rubber: Sheet, strip and molded. (NAVORD Specification 2512) Nov 1944. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
Specifications and requirements are given for synthetic rubber for use as gaskets, seals and molded parts in torpedoes. The rubber should be of the medium soft and medium hard types of a vulcanized elastomeric compound of the butadiene-acrylonitrile copolymer type. Physical properties and physical tests are specified. Fig. I illustrates the tear test specimen.

PB 36102. U. S. BUREAU OF ORDNANCE. Synthetic rubber for gaskets: Sheet, strip, & molded, in the vulcanized state. (NAVORD Specification 1290) Oct 1942. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00
Specifications and requirements are given for synthetic rubber for gaskets. The rubber is to come in soft, medium, and hard grades. The method of physical testing is detailed.

PB 36098. U. S. BUREAU OF ORDNANCE. Thiokol grommet stock - molded synthetic rubber. (NAVORD Specification 2626) Nov 1942. 1 p. Price: Microfilm-$1.00 - Photostat-$1.00

Specifications are given for thiokol stock to be used for grommets and similar parts. Hardness, tensile strength, and resistance to heat, cold, and oil are considered.

PB 36939. U. S. WAR DEPARTMENT. Identification, inspection, classification, reconditioning, and disposition of synthetic inner tubes. (Tech Bulletin ORD 239) Jan 1945. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00
This bulletin is designed to provide instructions for salvaging and returning to service a maximum percentage of unserviceable synthetic inner tubes from army equipment in the United States, and, also, insofar as practicable, in theaters of operation.

STONE, CLAY, AND GLASS PRODUCTS

PB 33981. HERAEUS processes for quartz glasses: Special processes. n.d. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00
According to this report, both clear and opaque quartz glass articles are being made in Germany by the Heraeus processes in a great range of shapes and sizes, from tiny capillaries to heavy walled ones six inches in diameter, as well as optical slabs, crucibles of all sizes, vessels, plates, cups, and saucers. The raw material for the transparent quartz is pure Brazilian quartz crystal, while that for the opaque variety is a quartzite sand from Vogelsberg, Germany. The transparent products are formed by fusing fragments of the Brazilian crystals in an Oxy-acetylene flame. The furnaces for this purpose are small, rectangular steel boxes with a large quartz tube forming the interior. This same process yields opaque silica glass when silica sand is substituted for the fragments of Brazilian crystal. Electrical arc heating is employed to make most of the opaque quartz glass because this method is readily adapted to making larger units and is more economical. The equipment and processes used are described. Diagrams illustrating the equipment are included.

PB 19597. HAAZ, W. Bleichtone (Bleaching earths) (Reichsforschungsrat) . (ALSOS Mission, RFR 505 15) Oct 1944. 3 p. Price: Microfilm - 50¢ - Photostat - $1.00
Short report on X-ray studies of 3 samples of Fullers' earth and of bentonite. Each sample was separated into 7 fractions of different particle size by use of Atterberg's elutriation analysis. Special mention is made of the roentgenographic technique and the X-ray tubes used. In German.

PB 19444. SAUER. Zemente für die bohrindustrie. (Cements used in oil drilling).(Reichsforschungsrat) (ALSOS Mission RFR 507 35) Oct 1944. 7 p.
Price: Microfilm-50¢ - Photostat-$1.00
This article, the eleventh in series, reports on tests of the suitability of samples of cement submitted by the Portland-Cement-Fabrik Alemannia for use in oil well drilling. The sample, Z325, was mixed with concentrated rock salt solution and soda was then added to the mixture to hasten the hardening process. The present report presents tables and charts showing the results of these tests on tensile strength and settling time. In German.

PB 36033. U. S. BUREAU OF ORDNANCE. Asphalt. (NAVORD Specification 1296) Jul 1942. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
This specification covers the manufacture and inspection of asphalt in accordance with American Association of State Highway Officials Specification M18-42, Grade B, with certain modifications.

PB 36063. U. S. BUREAU OF ORDNANCE. Cement, metallurgical, high temperature. (NAVORD Specification 1129) May 1939. 1 p. Price: Microfilm-$1.00 - Photostat-$1.00
This cement shall be dry, composed of high melting point clay or a chrome ore base with suitable binder such as sodium silicate. The cement must be quick air setting with a minimum expansion and suitable in all respects for cementing steel ladle sleeve joints, steel ladle spouts and patching in direct contact with metal at 3000° to 3500°F. Testing of deliveries is explained.

PB 34954. U. S. BUREAU OF ORDNANCE. Foundry silica sand for use in the foundry of the Naval Gun Factory. (NAVORD Specification 905) Apr 1935. 6 p. Price: Microfilm - $1.00 - Photostat - $1.00
This specification covers three grades of foundry silica sands with physical properties as specified in Table I and methods of sampling and tests given.

PB 36007. U. S. BUREAU OF ORDNANCE. Glass, laminated: Specifications for laminated glass for fire control instruments. (NAVORD Specification 1112) Dec 1942. 3 p.
Price: Microfilm-$1.00 - Photostat-$1.00
The purpose of this specification is the procurement of high grade laminated glass not exceeding 1/4 inch in thickness for fire control instruments, consisting of an assembly of two glass plates with an interposed layer of polyvinyl acetal resin requirements, tests and methods of packing and marking are outlined in detail.

PB 36064. U..S. BUREAU OF ORDNANCE. Kaolin, lead free. (NAVORD Specification 1391) Jul 1943. 3 p.
Price: Microfilm-$1.00 - Photostat- $1.00
This specification covers detail requirements, methods of sampling, inspection and tests, and packaging, packing and marking of kaolin which shall consist essentially of a hydrated aluminum silicate.

STRUCTURAL ENGINEERING

PB 39453. U. S. ENGINEER OFFICE, FORT PECK, MONT. Notes of principles & applications of soil mechanics. Jun 1939. 423 p. Price: Microfilm-$9.00 - Photostat-$29.00

The present era of earth-dam construction has demanded the scientific study of the nature and properties of soils, of field and laboratory methods for accurately determining these properties, and of rational methods of analyzing the action of earth structures and foundations. As progress has been made, the field has broadened, until now soil engineering and soil mechanics is one of the major branches of the engineering profession. It is the purpose of these chapters to outline briefly the more important phases of this new branch of engineering, and to point out some of its practical applications to foundations and the earth embankments. The following appendices are included: I - Mechanical analysis of small soil samples by the manometric method; II - Deflocculation of soil suspensions; III - Methods for determination of soluble constituents in soils. A bibliography first giving general references and then individual references for each chapter and appendix is also included. Tables, photographs, graphs and drawings accompany the report.

TEXTILES AND TEXTILE PRODUCTS

PB 33104. FALES, WILLIAM D. and others. Textile education in Germany. (Text of PB 3892, with foreword, chart and list of schools added). (FIAT Final Rept 542) Nov 1945. 39 p. Price: Microfilm-$1.00 - Photostat-$3.00

This report contains the text of PB 3892 (Bibliography, Vol. II, p. 150), with the addition of a foreword by William D. Fales, a chart showing the plan of organization of a German textiles school, and a list of 59 German textile schools, giving location and nature of curriculum.

PB 34745. ROBERTSHAW, GEOFFREY M. German wool-combing industry and wool-grease extraction processes. Jan-Feb 1946. (BIOS Final Rept 474, Item 22, 31) Jul 1946. 70 p. Price: Microfilm-$2.00 - Photostat-$5.00

This report summarizes the information gained during the investigation of the German wool-combing industry by stating that from a technical point of view little new information has been discovered. A visit to the works of Schachenmayr, Mann & Co., at Salach (Wurt), disclosed a substitute for leather on the preparing boxes, combs and finishers. The material was supplied in rolls by I. G. Farben, and cemented into the required sizes. The life of these substitutes was stated to be equal to, if not better than, that obtained from leather. The process of cementing and making up of these leathers was regarded as secret and the plant was well guarded. The extraction of wool grease products falls into two categories: (1) Works where grease extraction is carried out on extremely unscientific and antiquated lines; and (2) works where a very elaborate plant for the benzine extraction process has been installed. A list is given of chemical engineers and dealers who have supplied materials to grease extraction plants in the British Zone of Germany. Detailed reports of visits to the following plants are presented, including data on processing and types of machines in use, and in some cases, investigation of the methods of extraction of wool grease from wool scouring liquor: Wollwaescherei & Kammerei, Döhren bei Hannover; Hamburger Wollkämmerei G.m.b.H., Harburg-Wilhelmsburg; Bremer Wollkämmerei, Blumenthal (Unterweser); Kammgarnspinnerei Delmenhorst G.m.b.H., Delmenhorst; Schoellersche Kammgarnspinnerei Eitorf A.G., Eitorf (Rheinland); Schachenmayr, Mann & Co., Salach (Würt); and Merkel & Kienlin, G.m.b.H., Esslingen. Diagrams of plant layouts are included.

PB 34891. U. S. CLIMATIC RESEARCH LABORATORY, LAWRENCE, MASSACHUSETTS. Mask, field, pile, experimental: A study of the comfort, ease of fitting, protection against cold and general utility of the mask, field, pile, experimental models, and comparison of them with other masks. (Rept 113) Oct 1944. 33 p. Price: Microfilm-$1.00 - Photostat-$3.00

The purpose of this study was to determine the general utility and comparative desirability of several types of face masks for protection of troops against extreme cold. It was recommended that consideration be given to standardizing the latest model of the experimental double-faced wool face mask; that consideration be given to treating the wool pile for shrink-proofing or that other means of sterilization than boiling be investigated; and that this mask should be given at least one cold weather field trial. Appendices, as follows, are included: (1) List of agenda; (2) experimental data; (3) tables; and (4) photographs.

TRANSPORTATION EQUIPMENT

AERONAUTICS

The 23 documents listed below (PB 28673 to 28690 and 33141 to 33145) are a major part of a series of 25 reports on compressor and fan design written by German engineers and published by Code 338 of the Bureau of Ships of the U. S. Navy Department. Also included is one volume (PB 28689) which is not part of this series but is included in this subject matter group and is published by the same agency. These reports were written by German engineers, of Dr.-Ing. Bruno Eckert's group of the "Institut für Kraftfahrwesen und Fahrzeugmotoren an der Technische Hochschule, Stuttgart." The compressor articles primarily cover the design of axial flow compressors although the theory and design of all types of compressors is discussed. The articles on fans include some discussion of engine cooling also. Some of their design practice is inferior to current American practice, but their detailed investigations of loss factors, their experimental techniques and instruments, their theoretical analyses, and their viewpoints on design problems of current interest are valuable as source material for American designers. Preliminary translations were made by German prisoners of war under the control of the Bureau of Ships. The final translations and editing were done by American gas turbine designers. Dr. C. W. Smith of the General Electric Corporation performed the important task of final editing of all of the articles in order to remove the most flagrant inconsistencies in nomenclature and terminology. Volumes 20, 23, and 25 are missing from the abstracts in this series. It is hoped to include them in this bibliography at a future date.

PB 28673. ECKERT, B. An electrical dynamometer for the direct measurement of mechanical power, torque and BHP for very high shaft speeds. FKFS report No. 10-1276/3. Oct 1945. (BUSHIPS 338) May 1946. 22 p. Price: Microfilm-$1.00 - Photostat-$2.00
Volume 1, written in Oct. 1945, describes the principles of operation and problems in the design of an electrical dynamometer operating on differential voltage, built to measure speed, torque and power. It is shown that all three quantities can be measured with satisfactory accuracy up to speeds of about 20,000 RPM. The main problem of zero disturbances is discussed, and a satisfactory solution is presented. Graphs, diagrams, and drawings are included.

PB 33141. ECKERT, B. A temperature measuring device for the exact determination of the internal adiabatic efficiency of a compressor. FKFS report Nos. 101276/5, 10 1276/9. Nov 1945 - Feb 1946. (BUSHIPS 338) May 1946. 99 p. Price: Microfilm-$2.00 - Photostat-$7.00
This publication is volume 2 of a series of articles on compressors, fans, and related subjects written by German engineers of Dr. Bruno Eckert's group, "Institut fur Kraftfahrwesen und Fahrzeugmotoren an der Technischen Hochschule, Stuttgart." This volume describes a temperature probe and sensitive bridge circuit used in testing compressors and fans. The instrument consists of a resistance thermometer, transmitter, bridge, and amplifier with a power supply. In the past, the usual method of measuring mechanical efficiency of a turbine or compressor has been the determination of the power input under special operating conditions. Under the limitations imposed by the construction of the axial flow compressors, a better method of determining the internal adiabatic efficiency depends on measurements of temperature of the fluid before and after the compressor stage. Many curves, drawings, diagrams, photographs and tables are included.

PB 28674. U. S. NAVY DEPARTMENT. The influence of physical dimensions (such as hub: tip ratio, clearance, blade shape) and flow conditions (such as Reynolds number and Mach number) on compressor characteristics. (Parts A-R, FKFS reports) (BUSHIPS 338; Wright Aeronautical Corp Eng Translation 22,29) May 1946. 108 p. Price: Microfilm-$3.00 - Photostat-$8.00
Volume 3 consists of three parts. Part A is "Summary of the results of research on axial flow compressors at the Stuttgart Research Institute for Automobiles and Engines," by B. Eckert. Part B is "The influence of the diameter ratio on the characteristics diagram of the axial compressor" by B. Eckert, F. Pfluger and F. Weining. Part C written Dec 1944, is "The influence of the rotor on the compressor efficiency," by Fichert. These reports discuss the influence of such factors as hub tip ratio, clearance, Re number, Mach number, blade shape, blade camber, blade finish and angle of attack on compressor characteristics. The reports were translated by engineers of the Wright Aeronautical Corporation and by J. Rodmer of Precision Development Co. Graphs, tables, photographs, drawings, design data and bibliography are included.

PB33142. ECKERT, B. and others. Manufacturing and strength considerations of axial compressors. (Part A, from JIL 1941, an FKFS report; Part B, from Lilienthal-Gesellschaft report No. 171). (NAVSHIPS 250-338-1) Jun 1946. 62 p. Price: Microfilm-$2.00 - Photostat-$5.00
This report is volume 4 of a series of translations of compressor and fan articles written by German engineers of Dr. Ing. Bruno Eckert's group. This volume describes methods of manufacturing master blades for axial flow compressors and presents the detailed calculations for determining the stresses in the first and last stages of a counter-rotating compressor. Part A is a discussion of "Manufacture of the Blades for Axial blowers" by B. Eckert and S. Mlaker. (Part A has been abstracted from the original German as PB 24106.) The manufacture of a blower blade is achieved by calculation of the depth of the blade and the angle between the tangential direction and the chord of the blade for any number of parallel sections. The "Institut für Kraftfahrwesen und Fahrzeugmotoren an der Technische Hochschule, Stuttgart," has designed a new milling machine by means of which single blades and blade rotors for axial blowers can be manufactured precisely with a satisfactory surface finish. Advantages and disadvantages, and future improvements on the machine are discussed. Part B consists of a discussion of "The stresses in the rotors of the first and last stage of a counterrotating axial compressor," by E. Moeck and M. Schilhansl. Drawings with design data, photographs, curves and tables are included.

PB 28675. U. S. NAVY DEPARTMENT. Basic considerations in the design of axial flow compressors. (Part A; Lilienthal-Gesellschaft report 171, part 2; Part B; FKFS report) (BUSHIPS 338; Wright Aeronautical Corp Eng Translation 25,32) May 1946. 80 p. Price: Microfilm-$2.00 - Photostat-$6.00
Volume 5, Part A by F. Weining is "Calculation fundamentals for multistage axial compressors" and Part B, written in April 1944, by B. Eckert and A. Weinig is "Axial flow compressors." This volume presents bases for design of axial flow compressors. It shows the application of the stream filament and aerfoils theories to the calculation of axial flow compressors and gives actual blade shape and position. This volume was translated by W. C. Weekley and Robert A. Cole of Wright Aeronautical Corporation. Photographs, graphs, tables, design data and bibliographies are included.

PB 28676. ECKERT, B. Basic design calculations for single-circuit jet propulsion power plants. FKFS report No. 10-1276/2. Oct 1945. (BUSHIPS 338) May 1946. 83 p. Price: Microfilm-$2.00 - Photostat-$6.00
Volume 6 discusses the conditions to be met by an aircraft jet propulsion plant and the calculating procedure for the design of the plant. The aerodynamic and thermodynamic analysis made in this report leads to physically clear, determinate equations for determining the optimum weight flow of air, the corresponding fuel flow, and the required amount of compression, taking due account of the effect of airplane velocity, efficiency of energy transformation in the individual parts of the power plant, change in the thermal properties of the working substance during the process, and effect of the absolute gas temperature on the metallurgical properties of the materials used. Included are a series of graphs on which are plotted the variables that affect efficiency of the power plant so that its value can be read quickly, easily and accurately for any given combination of the variables at either sea level, troposphere, or stratosphere conditions. Other graphs are drawings are also included.

PB 33143. KUHL, H. and SCHMIDT, FRITZ A. Review of research of gas turbines carried out at D.V.L., Garmisch. Jul 1944 - Jun 1945. (Wright Aeronautical Corp Eng Translation 6, B; NAVSHIPS 250-338) Jun 1946. 77 p. Price: Microfilm-$2.00 - Photostat-$6.00
Volume 7 describes research on cooling turbine blades, combustion chamber problems, and methods of governing turbo-jet and propellor-turbo-jet power plants. This volume consists of two parts, Part A: "Investigations into governing TL(turbo-jet) and PTL(propeller-turbo-jet) engines" by H Kuhl, D.V.L July 1944 and Part B: "Report on turbo-jet research of the DVL Garmisch group" by Prof Fritz A. F. Schmidt. Jun 26, 1945. The report is illustrated with drawings, graphs and photographs. This volume was translated by W. C. Weekley and Robert A. Cole of the Wright Aeronautical Corporation.

PB 28677. U. S. NAVY DEPARTMENT. Matching of compressor stages and compressors for good part load operation. (Part A, from Lilienthal-Gesellschaft report No. 171) (BUSHIPS 338) May 1946. 31 p. Price: Microfilm-$1.00 - Photostat-$3.00
Volume 8 includes Part A "Compressor characteristics and starting powers of jet propulsion power plants" by A. Hagen, and Part B "The operating characteristics of multi-stage compressors" by Senger, which was a V.D.I. lecture. Part A discusses the fundamentals of the starting process for a gas turbine plant and indicates methods of keeping the power requirements to a minimum through proper design of the staging. Part B discusses the limits of stable operation of compressors or compressor stages in series and factors which influence stability. Graphs and design data are included.

PB 28678. U. S. NAVY DEPARTMENT. Information on unconventional compressors. (Parts A, C, from Lilienthal Gesellschaft report no. 171; Part B, FKFS report). (BUSHIPS 338) May 1946. 69 p. Price: Microfilm-$2.00 - Photostat-$5.00

Volume 9 includes three reports. Part A is a Lilienthal Society Report by A. Weise "A supersonic axial compressor." Part B, originally published in 1940, by B. Eckert is "Axial compressors with high pressure coefficients." Part C, by Pabst von Chain, is a Lilienthal Society Report "A mixed flow-axial flow compressor." Part A discusses a design which aims at increasing the stage pressure ratio of the axial to the same level as that of the centrifugal compressor. In this connection are also studies of boundary layer separation in compression shocks. Part B discusses the design and test results of a high lift coefficient (subsonic) compressor by the use of curved airfoils. Part C discusses the design and test results on a compressor using one mixed flow stage followed by several axial flow stages with interstage passages correctly dimensioned. Drawings, graphs, and photographs illustrate this document.

PB 28679. ECKERT, B. Characteristic numbers for flow machines based on the Newtonian theory of dynamic similarity. FKFS report No. 10-1276/4. Nov 1945. (BUSHIPS 338) May 1946. 52 p. Price: Microfilm-$2.00 - Photostat-$4.00

Volume 10 describes dimensionless groupings which can be used for design of, and evaluation of test results of flow machines. The mechanics of similarity point out methods of comparing similar flow machines, using the characteristic numbers developed from the Newtonian Theory of Dynamic Similarity. Various laws of similitude can be devised for fundamental static, dynamic and thermodynamic similarity to aid the designer of flow machines in selecting the most suitable and useful machine type for the given design conditions. It will save the designer time and errors and indicate methods of designing for maximum efficiency. Calculations are given for flow coefficient and pressure coefficient, and dimensionless characteristic numbers for axial flow compressors, propellers, windmills, marine screw turbines, Kaplan turbines, mixed flow compressors, radial flow compressors, Francis turbine, Pelton impulse turbine, axial turbine, Roots compressor, Lysholm compressor, Vane compressor and reciprocating compressors. The throttling coefficient and the dimensionless specific speed calculations in several cases are given. The definition of dimensionless characteristic numbers for multi-stage and multi-flow machines, and the relation between stage and overall characteristic numbers are discussed, and formulas given for specific cases. Curves, design data, tables and bibliography of 22 items are included.

PB 28680. U. S. NAVY DEPARTMENT. The design of 50% reaction compressors and results of tests of individual stages. (Part A, FKFS report; Parts B-C, FKFS report Nos. 70 707/1, 339) 1941-1945. (BUSHIPS 338) May 1946. 102 p. Price: Microfilm-$3.00 - Photostat-$7.00

Volume 11 includes three reports. Part A, by B. Eckert and F. Weinig, is "Axial flow compressors designed for 50% reaction." Part B, by B. Eckert is "Design and layout of an axial compressor for BMW 109-003A1." Part C, by B. Eckert and W. Kobel is "Computation of six stage axial supercharger." Part A presents test results of individual stages of a 50% reaction compressor showing the effect of inlet hub fairing, hub-to-tip ratio, clearance between rotor and stator, and movable guides. Part B covers the design of a seven stage compressor which gave desired efficiencies at full and starting speed even with design restrictions. Part C describes computation and design of a six stage axial compressor with a simplified design that requires only four master blades for the entire rotor and stator. Tables, curves, drawings and design data are included.

PB 28681. ECKERT, B. Calculation and design of flow machines in aircraft power plants. FKFS report. (BUSHIPS 338) May 1946. 187 p. Price: Microfilm-$4.00 - Photostat-$13.00

This report (volume 12) defines and discusses the design of the various types of centrifugal and axial flow devices used in connection with aircraft engines. The text subdivides the material considered into the following: Cooling fans, scavenging blowers, superchargers, and exhaust gas turbines. The text is liberally illustrated with graphs, photographs, design drawings and sketches.

PB 28682. MARCINOWSKI, H. The significance of the measured lattice characteristics for calculation and design of axial flow turbines and compressors. Lilienthal-Gesellschaft report 171. 1944. (BUSHIPS 338) May 1946. 27 p. Price: Microfilm-$1.00 - Photostat-$2.00

Volume 13, from the Lilienthal-Gesellschaft discusses the significance of stationary lattice tests and indicates methods of applying test results to the design of axial compressors. The problem of flow through a lattice (called also a grid or cascade) is simply that of designing a set of blades for which the optimum operating point will correspond to a certain specified flow and pressure rise, and for which the efficiency will be as high as practicable. The analysis here given is a two-dimensional treatment based on the assumption that the flow is along cylindrical or conical surfaces concentric with the axis of rotation. Partial lattices then are the cylindrical sections of ordinary blading developed into plane surfaces. This paper deals only with plane flow through such partial lattices, primarily with retarded or diffusing flow. Graphs and a bibliography of 14 items are included.

PB 28683. U. S. NAVY DEPARTMENT. Positive displacement rotary compressors (Roots and Lysholm types). FKFS report Nos. 417, 5016. 1942 - 1944. (BUSHIPS 338) Apr 1946. 101 p. Price: Microfilm-$3.00 - Photostat-$7.00

Volume 14 includes two reports. Part A, by B. Eckert and F. Weinig is "Computation and layout of Roots-type supercharger blowers." Part B, by B. Eckert and P. H. Heim is "Tests of Lysholm test compressors." Part A discusses the application of the Roots type compressor and describes its operating principle, the method of design and its performance characteristics. Part B discusses tests on two Lysholm type compressors to determine their suitability for use a s cabin superchargers at high altitudes. Many graphs, tables, photographs, drawings and design data, and a bibliography of 9 items are included.

PB 28684. U. S. NAVY DEPARTMENT. Some problems related to the cooling of aircraft engines. (Part A, FKFS report; Parts B-C, Daimler-Benz report 30 AK Nos. 23, 29) 1941 - 1944. (BUSHIPS 338) May 1946. 79 p. Price: Microfilm-$2.00 - Photostat-$6.00

Volume 15 contains three reports. Part A, by L. Bernforfer is "Preliminary computation of the cooling characteristics of Engine D." Part B, a Daimler-Benz report by K. Schnetzer is "Development of efficient annular radiators and their advantages over other types of radiator, especially from the viewpoint of building standard power plants." Part C, by K. Schnetzer is a Daimler-Benz report on "Engine installations with free-entrance radiators." Part A covers a method of measuring the cooling characteristics of the engine at various altitudes and the problem of the design of fins for the proper guidance of the cooling air around the cylinder. Part B outlines a research program made to determine what type of radiator would be most suitable both mechanically and aerodynamically, and tests to insure the highest possible aerodynamic efficiency of the annular radiator installation. Part C discusses the possibility of effecting a 20% reduction in drag and fuel consumption by the installation of a free entrance annular radiator used with a pusher propeller. Graphs, photographs, drawings and design data are included.

PB 28685. ECKERT, B. Supercharger for aviation engine FKFS 9-900VI D engine. FKFS report No. 10-1276/6. Nov 1945. (BUSHIPS 338) May 1946. 184 p. Price: Microfilm-$4.00 - Photostat-$13.00

Volume 16 describes in three parts, the detailed design of an axial flow supercharger for a contemplated 5,000 hp, 48-cylinder aircooled aircraft engine. Part I discusses different types of compressors and their dimensions, with a critical discussion of 11 different projects, evaluating them with respect to weight, mechanical and aerodynamical design, output control etc. Part II includes the design calculations of axial flow compressors for the D engine. It contains the computation of the principal dimensions and the

aerodynamical calculations of the individual stages taking into account the effect of Mach numbers and the exact predetermination of the efficiency to be expected. Part III contains the mechanical calculations of the axial flow compressor discussed in part II, including stresses, natural frequencies of the blades, and calculations of the forces and stresses in the wheels. Graphs, nomograms, tables, drawings, and design data are included. There is a bibliography of 17 items.

PB 33144. ECKERT, B. Superchargers for automotive engines. An FKFS report. 1943. (BUSHIPS 338) May 1946. 114 p. Price: Microfilm-$3.00 - Photostat-$8.00
This is volume 17 of a series of articles on compressor and fan design written by German engineers of Dr. Ing. Bruno Eckert's group, "Institut für Kraftfahrwesen und Fahrzeugmotoren ander Technischen Hochschule, Stuttgart." This volume discusses the advantages of supercharging automobile engines, the requirements to be met by the supercharger, the characteristics of various types of superchargers, and discusses the use of a gas turbine drive for the supercharger. The purpose of compressor application to internal combustion engines is to improve the effectiveness of a given displacement at the same rotary speed by increasing the weight of the cylinder charge. In consequence of the higher cylinder pressures developed by supercharging, an acceleration of the combustion process, and also an improvement in the mechanical efficiency is attained, since the frictional losses increase at a slower rate than does the effective power output of the cylinder. This book is liberally illustrated with photographs, graphs and drawings.

PB 28686. ECKERT, B. Cooling fan for Daimler Benz 632 - aircraft engine. FKFS report No. 90-990/1. Mar 1944. (BUships 338) May 1946. 31 p. Price: Microfilm-$1.00 - Photostat-$3.00
Volume 18 discusses the design conditions to be met and the method of design of an aircraft axial cooling fan for the Daimler-Benz 632 aircraft engine. Structural specifications and the delivery rate of the fan are determined, and the characteristics and normal working range of the fan are calculated. Cooling conditions during climb, at standard atmosphere, and at high-speed flight are determined. Controls and blade dimensions are worked out. Many graphs, drawings, and tables are included.

PB 28687. U. S. NAVY DEPARTMENT. Design of an axial flow cooling fan with adjustable inlet guide vanes. FKFS report Nos. 398, 402. Jun - Aug 1941. (BUSHIPS 338) Apr 1946. 55 p. Price: Microfilm-$2.00 - Photostat-$4.00
Volume 19 consists of two reports. Part A, by B. Eckert and W. Kobel is "Design of an axial flow cooling fan with adjustable inlet guide vanes." Part B is "Redesign of an axial flow fan with adjustable inlet guide vanes for BMW-802 engine." After much critical consideration, a detailed study was made of a control system in which the regulation is accomplished by adjustment of the inlet guide vanes. Regulation is effected by keeping the leading edge of each vane fixed, and turning the entire vane about this edge as a pivot in such a way as to change the blade curvature. It is possible with this control to obtain the required cooling air flow at all altitudes with a power expenditure varying from 192 to 156 hp. The exact position of the guide vanes at different altitudes must be determined by test. Tables, graphs, drawings and design data are included.

PB 33145. ECKERT, B. Experiments with an axial cooling fan blower. An FKFS report. Sep 1939. (BUSHIPS 338) May 1946. 105 p. Price: Microfilm-$3.00 - Photostat-$7.00
This report is volume 21 of a series of compressor and fan articles written by Dr. Ing. Bruno Eckert's group of the "Institute für Kraftfahrwesen und Fahrzeugmotoren an der Technischen Hochschule, Stuttgart." This report originally written in Sept. 1939, covers the design and test results of an experimental blower with various guide vane arrangements. Tests were made on an axial blower designed to cool aircraft engines. Poor test results and inconsistencies between the design theory and the test results were then investigated. The test set-up permitted tests with inlet, exit, and no guide vanes. A summary of results in relation to the calculations is given. Many curves, diagrams, photographs, drawings, tables and a bibliography of 13 items are included.

PB 28688. ECKERT, B. A collection of compressor test results. FKFS report No. 10-1276/7. Jan 1946. (BUSHIPS 338) May 1946. 148 p. Price: Microfilm-$3.00 - Photostat-$10.00
Volume 22, written in January 1946, contains about 90 characteristic plots of compressors, most of them being axial, radial or diagonal turbo-compressors. They are the results of years of work at the Stuttgart Institute and are published for their value as research data in developing new designs. The methods of computation, presentation and test are described. The usefulness of the plots has been extended by listing on them the various dimensions and design constants. A description of the test equipment and a discussion of the parameters used to represent the results is also presented. Photographs, graphs, sketches and design drawings are included in this report.

PB 28689. WEINIG, F. The flow around turbine and compressor blades. 1935. (BUSHIPS 338) May 1946. 173 p. Price: Microfilm-$4.00 - Photostat-$12.00
This document has been included with the navy series of articles on compressor and fan design described above although not actually a volume of the series. This is done because of the general similarity of subject matter. This translation of a German publication issued in 1935 was prepared by Max Hartenheim for the Elliott Company through whose courtesy it was made available to the Bureau of Ships. A revised translation will be issued at a later date. It contains some of the theoretical foundations for the design procedures of Eckert, and others and should be of value to axial compressor designers. The main subjects discussed in this book are: (1) The effect of series of buckets (2) straight profile grids (3) a special class of series of wings of finitely thick profiles (4) series of vanes of profiles of any shape (5) series of vanes of thin, weakly curved profiles (6) determination of the properties of a profile grid by means of the mesh method (7) inlet and outlet ends of grids of small pitch ratio (8) examples for the determination of a profile grid with prescribed properties. Illustrated with sketches and graphs.

PB 28690. ENCKE, W. Axial compressor. Lilienthal-Gesellschaft report 171. (BUSHIPS 338) May 1946. 34 p. Price: Microfilm-$1.00 - Photostat-$3.00
Volume 24 of this series, is a Lilienthal-Gesellschaft report which discusses the basic considerations in the design of multi-stage compressors. Beginning with the relation of the work of compression of a single stage to the number of stages and to the total pressure of a multi-stage compressor, the possibilities of improvement of the compressor and the design of the individual stage are discussed. Characteristic curves of several types of Göttingen rotors are shown, based on tests made partly with varying Mach and Reynolds numbers, and partly with varying radial length of blade. Problems of measuring technique are discussed, and stroboscopic photographs of compressor blades are shown, as well as photographs of the icing of a compressor with and without guide vanes. Problems of manufacture and strength are discussed, and finally the design of an 11-stage compressor is outlined. The book includes photographs and graphs.

PB 30864. SIEGEL, H. W. and others. Aeronautical Symposium at the California Institute of Technology on Mar 14, 15 and 16, 1946. (AAF AMC Eng Div Memo Rept TSEAC13-4589-15-1) Apr 1946. 5 p. Price: Microfilm-$1.00-Photostat-$1.00
On March 14, 1946, there was held a session on aerodynamic problems in the design of high-speed aircraft; on March 15 a series of papers on the physics of the upper atmosphere; and on March 16 a session on fundamental problems in com-

bustion and gas dynamics, and a discussion on instrumentation for high altitudes. Papers presented at these meetings containing material of interest to the Air Materiel Command are discussed. Papers briefly reviewed are: Pressure correction formula for two-dimensional transonic flows, by H. S. Tsien; First-order theory for flows of compressible fluid over a body of revolution by W. R. Sears; Lift of a delta wing at supersonic speeds, by H. J. Stewart; The application of analytical extension in the solution of problems of supersonic conical flows, by P. A. Lagerstrom; A new method of designing a two-dimensional Laval nozzle for uniform flow, by Juno Foelsch; and Superaerodynamics-mechanics of rarefied gases, by H. S. Tsien. Dr. K. H. Nichols presented an idea for measuring very low ambient pressures when moving at high speed and Dr. S. Gutenberg suggested use of smoke puffs emitted by a missile for measuring wind velocities.

Aircraft

PB 30529. DAVIES, CHARLES A. Taxiing tests of 19-inch Goodyear dual tire nose wheel, part no. EX95089, on P-39F airplane. (Army Air Corps Materiel Div Memo Rept EXP-M-51/AD1036). Mar 1942. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00

This report gives the results of tests made to determine the rolling characteristics and safety advantages of a dual tire nose wheel. It was found that the dual tire wheel had a tendency to throw mud but it was thought that this fault could be corrected with a change in design and spacing of the tires. The double tired nose wheel would also permit safe operation in case of failure of one or both tires, and would be more satisfactory for larger airplanes. Higher pressures in the dual tire wheel should provide higher energy absorption and better operating characteristics without seriously affecting the floatation.

PB 30527. HAMILTON, R. C. Propeller feathering test. (AAF Materiel Command Memo Rept ENG-57-503-1197) May 1944. 18 p. Price: Microfilm-$1.00 - Photostat-$2.00

This is a report of the completion of a 500 cycle propeller feathering test conducted on an Army Air Forces R-1820-97 engine. It was concluded that engine operation in the full-feathered position should be avoided because of heavy back-firing, occasional engine stoppage due to spark plug fouling and the detrimental carbon deposits that are formed on the walls of the combustion chamber. Photographs and drawings.

PB 30515. HORST, C. O. Failure of landing gear side brace no. 35258 - P-43 airplane. (Army Air Corps Materiel Div Memo Rept U-EXP-M-51-5279) Nov 1941. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00

The purpose of this report by the Air Corps, Materiel Division is to comment on unsatisfactory report No. 41-186 from Selfridge Field on subject failure. It was recommended that a means of releasing all pressure in the hydraulic systems of P-43 airplanes, as set forth in the conclusions of this report, be not concurred in since normal actuation of the landing gear releases all pressure in either one direction or the other, allowing the landing gear to move in response to pressure from the direction in which it has not been released. It was also recommended that immediate replacement of the subject landing gear side braces No. 35258 on P-43 airplanes be made when the redesigned parts of greater strength are available.

PB 30522. HOUGHTON, E. M. Sensenich propeller blank. (Army Air Corps Materiel Div Memo Rept EXP-M-56-4137) May 1942. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00

This document reports on the testing of the quality of birch propeller blanks produced by Sensenich Brothers, Lititz, Pennsylvania. The material consisted of one rought-cut propeller blank of six laminations glued with Bakelite cold-setting urea-formaldehyde resin BCU-12772 adhesive using Bakelite BK-14388 catalyst. The average shearing strength was 2858 psi and the wood failure 86.8 percent. Samples taken at random over the entire area of the block were immersed in water at room temperature for 8 hours and dried at room temperature for 16 hours. Breakdown occurred at the end of 8 cycles. The moisture content was 7.4 percent and the specific gravity was .64. The procedure and discussion are given in appendices. The material satisfactorily passed the minimum allowable requirements of Army Air Forces Specification No. 14110, Glue, Resin, Cold-setting.

PB 28741. LOGAN, JOHN W. and HUTT, A. E. WOODWARD. Aircraft - Paris zone. (CIOS File IV-7 & V-16), Item 25) Aug-Sep 1944. 29 p. Price: Microfilm-$1.00 - Photostat-$2.00

Forty-eight targets in the Paris area were visited in order to learn German developments in aircraft. However, very little was learned through the interrogation of French engineers, since the Germans had revealed very little information to their French associates. The most important findings were blueprints of two bombers the He 274 and FW 300A, which had been concealed from the Germans. Some details of these and other planes are discussed in this report. A list of German documents, siezed by the investigators is found in the appendix.

PB 33112. MORSE, J. H. Flight testing methods of the Japanese Navy. (AAF T-2 Air Tech Intelligence Review F-IR-53-RS) Jun 1946. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00

This information was obtained through an interview with Captain Kunize Terai. In general, the flight test procedures used by the Japanese Navy were very similar to those of the American Navy. A flight test group at Yokosuka thoroughly evaluated and flight tested all new airplanes submitted to the navy. These tests included flight evaluation and tactical tests, but did not include an accelerated service test. There are no special training for test pilots. Pilots assigned to test work, however, were carefully selected from service pilots with good records. Procedure for testing new model is described.

PB 30519. SMITH, L. C. Molded plywood wing flap for BT-13 airplane. (Army Air Corps Materiel Div Memo Rept EXP-M-56-4039) May 1942. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00

This is a report of the testing to determine the physical and mechanical properties of the skin and joints of a fabricated wood and plywood airplane wing flap submitted by the Allied Aviation Corporation, Dundalk, Maryland. The strength of the plywood skin when tested longitudinally compared favorably with that of standard plywood. Strength transversely may have been reduced by poorly made and poorly glued edge joints between the veneers. The strength values of the glue bond in the plywood skin were satisfactory in the dry and wet glue shear test. Strength values of internal glued joints were satisfactory and the joints were not adversely affected by soaking in water.

PB 34813. U. S. BUREAU OF AERONAUTICS. Handbook of instructions with parts catalog: Electric turret drive models 20GD60USC1, 20GD60USC2, and 20GD60USC3. (Manufactured by General Electric Co., Schenectady, N. Y.) (NAVAER 11-450-5) Jun 1944. 196 p. Price: Microfilm-$4.00 - Photostat-$13.00

This handbook includes instructions for the operation, service and overhaul of the General Electric turret drives which are part of a power driven turret manufactured by the Glenn L. Martin Co. The handbook also contains a catalog of parts which is divided into the following parts: Group assembly parts list; numerical parts list; and standard parts list. Photographs and drawings illustrate the handbook.

PB 28748. WATSON, P. H. and MAKOWSKI, S. A. German landing gear, design, and testing. (BIOS Final Rept 251, Item 25) Oct 1945. 21 p. Price: Microfilm-$1.00 - Photostat-$2.00

The object of this investigation was to ascertain German experience of airplane undercarriages and their methods of design, testing and manufacturing them. Inquiries were also made about their methods of testing wheels for strength. It was found that the relations between the aircraft and undercarriage firms and the German Air Ministry developed in much the same way as in England. Their experience generally was similar to the British except for the troubles due to higher landing speeds. These high landing speeds - up to 150 m.p.h. - caused large drag forces due to spinning up of the wheels at touch down which in turn caused the shock absorbers to jam, making the tires collapse. German design requirements specified higher standards of energy absorption and strength than used in England. For some time they have had a requirement specifying that the energy to be absorbed between proof and ultimate conditions is to be at least 50 percent of that absorbed at proof conditions. German methods of construction followed orthodox practice generally except for their much wider use of welding, including flash welding. Detailed descriptions of plant and machinery at V.D.M. Luftfahrtwerke AG, Grossauheim nr. Hanau, and at Klma GmbH, Waiblingen nr. Stuttgart, are presented. Shock absorber construction is discussed, also aircraft landing gear design, wheels and tires. Diagrammatic drawings of shock absorbers, and sketches of three main stressing cases, are included.

PB 36183. WENDLAND, FRITZ. Heizung und lüftung von flugzeugen (Heating and ventilation of aircraft). (Deutsche Luftfahrtforschung FB 1585) Apr 1943. 138 p. Price: Microfilm-$3.00 - Photostat-$10.00

This report from the "Zentrale für wissenschaftliche Berichtswesen der Luftfahrtforschung des Generalluftzeugmeisters (ZWB)" discusses the calculations and design of heating and ventilating systems for aircraft, particularly commercial aircraft. Illustrations, graphs and a bibliography are included.

PB 28295. WINSTON, C. B. Radio noise investigation on type A-2 gun turret. (AAF Material Center Memo Rept EXP-M-54-656-543) Aug 1942. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00

This report covers visit to the Briggs Manufacturing Company, Detroit, Michigan, to conduct radio noise tests on the subject turret, and to assist the manufacturer in the problems incidental to the installation of a suitable filter for the suppression of the radio noise produced by the subject turret. After completing the radio noise tests, a conference was held to discuss the modifications necessary to adapt the filter to the turret assembly. These modifications are described. It is recommended that the Briggs Manufacturing Company be authorized to furnish the filters installed on the turret assemblies; that the Armament Laboratory require the installation of these filters on the balance of turrets on contracts not completed.

PB 28296. WINSTON, C. B. Radio noise tests on AT-11 airplane. (Army Air Corps Materiel Div Memo Rept EXP-M-54-656-543A) Aug 1942. 3 p. Price: Microfilm-$1.00-Photostat-$1.00

Radio noise measurements were made during flight to determine noise influence voltage on the power line at the receiver junction box and the receiver antenna. These measurements are shown on graph in accompanying appendix. The subject airplane is equipped with a Crocker-Wheeler-Manson, type A-8 power turret. This turret is not equipped with a radio noise filter. Radio noise tests indicate that the necessary filtering can be obtained by the installation of a capacitor. This capacitor could be installed by the turret manufacturer at the factory. This brief report recommends that the Armament Laboratory take the necessary actions to require the manufacturer of the type A8 turret to furnish the radio noise filter installed at the factory.

PB 28740. WOOD, R. MCKINNON. Horten Flugzeugbau G.m.b.H. (CIOS File XXII-6, Item 25) n.d. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00

The Horten brothers were interrogated regarding their work on "flying wings." A photograph of a Horten motor sailplane, of the flying wing type, is presented, together with a very brief description.

Instruments

PB 31182. BRIGHT, F. W. Adapter, radio altimeter, PQ-RATS. (AAF AMC Eng Div Memo Rept TSEPE-665-113) Jun 1946. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00

This report concerns the development and bench and flight testing of an adapter to provide for radio altimeter control of the altitude through the Remote Flight Control System in low flying PQ target airplanes. The kind of potentiometer employed to develop the follow-up voltage proved to be of high importance. Control voltages supplied by the adapter can with slight modifications be used for low altitude control in other airplanes equipped with other control systems. It is concluded that, in the future, the adapter should be equipped with easy means for wide changes in follow-up ratios in order to make it quickly adaptable to the various control systems, and the flight characteristics of any airplane to which it may be adapted.

Engines and Propellers

PB 28736. COMDEROY, J. A. German marine engines. (CIOS File XXVII-90, Item 29) n. d. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00

The factories of the Klockner-Humboldt-Deutz firm at Cologne and Oberursel were visited to obtain information on their development of marine engines. This firm was the largest manufacturer of diesel engines in Germany. Some details and diagrams are given of diesel engines for marine and other purposes.

PB 30498. CHOM, G. C. Hose and hose-clamps. (AAF Materiel Command Memo Rept EMC-54-656-908) Nov 1943. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a report of a conference held at North American Aviation, Inc., Inglewood, Cal., on Oct 3, 1943, regarding the poor quality of hose received at aircraft plants in the Los Angeles area. Hose clamps that were available in quantities were mainly of the Whitteck type, which have a diametrical motion when the screw is turned. This clamp causes bad distortion of the hose, and leaves a small opening on each side of the bridge. The combination of this clamp and the poor hose causes leaks after approximately three hours of operation, and makes necessary continuous readjustment of all hose clamps. Recommendations were made to correct this situation.

PB 33111. LASSWELL, PHILIP M. Sumitomo Kanzaki Propeller Factory. (AAF T-2 Tech Intelligence Review P-IR-52-RE) Jun 1946. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
The general outline of the company's experimental and research program for the past year was discussed with the company officials, and factory was inspected. Report concludes that the Sumitomo Propeller Division still was attempting to improve on obsolete foreign equipment and was not contributing any original designs in the propeller field. The company engineers designed several sets of propeller airfoils for high-speed airplanes and conducted wind tunnel tests with some of these airfoils. It was evident that no radical changes in design were incorporated, and as the tunnel speeds were only 440 mph the tests were not of particular interest. Due to material shortages, the army and the navy told the company to develop wooden propeller blades for existing hubs. Considerable work was accomplished and a satisfactory laminated wood process selected. Table presents data on experimental manufacture.

PB 18398. MASSAR. Energierückgewinnung bei flugmotorenprüfständen: wasserstoff und sauerstoffgewinnung. Bericht über eine besprechung in Berlin am 25 August 1944 beim generalinspector wasser und energie (Recovery of energy in aircraft engine test stands; obtaining of hydrogen and oxygen. Report on a conference in Berlin August 25, 1944 at the inspector-general for water and energy). (Reichsforschungerat). (ALSOS Mission XFR 311) Sep 1944. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
In aircraft engine plants every completed engine undergoes a break-in and run-in test. This report is a discussion of how to recover energy losses during those tests. Although the time of testing has been shortened on various occasions, there is still at least 20 min. testing time for each motor to account for, and the loss of energy during this time is under discussion. The energy can be used in various ways: (1) directly as electric energy for an electric power plant (2) or transformed to another form of energy, or a new possibility (3) for decomposition of water into "H" and "O". The hydrogen obtained could be used as fuel. Diagrammatic sketches are included.

PB 36480. NAUMANN, A. Ueber den standgütegrad von luftschrauben (On the degree of efficiency of aircraft propellers as determined on the test stand). (Deutsche Luftfahrtforschung FB 993) Nov 1938. 26 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report from the "Aerodynamisches Institut der Technischen Hochschule Aachen" discusses the results of tests involving a series of aircraft propellers. It is found that maximum propeller efficiency is attained with a blade setting that corresponds to the optimum mean gliding ratio of an equivalent wing profile. Tables and graphs are included.

PB 33109. SPANGLER, S. B. and MORSE, J. H. Gas turbine propeller rocket, jet engine design and development, and turbosupercharger development. (AAF T-2 Air Tech Intelligence Review P-IR-42-RE) Jan 1946. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
The gas turbine propeller rocket described here is a gas turbine propeller drive design developed in Japan since 1939, primarily by Captain Tanegasima. This design is of interest primarily as an example of relatively independent Japanese thought along the lines of jet and gas turbine design. Japanese interest in jet propulsion had been aroused about 1942 when word was received from Germany that such engines were in the practical stage. In July 1944 when the cross-sectional drawing of the BMW-003 was received from Germany, a general conference of all interested parties was called, and the decision made to concentrate immediately on the exclusion of all Japanese designed jets. The first attempts toward turbosupercharger design were initiated with the purchase of a Swiss Brown-Bovari unit in 1939. In general Captain Tanegasima considered that the actual construction of satisfactory turbosuperchargers had been accomplished by the Japanese, but that all attempts at installation in airplanes had been poorly carried out. General drawing of gas turbine propeller rocket is included.

PB 34411. U. S. ARMY AIR FORCES. Parts for Continental engines. (Stock List 02-C) Jun 1945. 48 p. Price: Microfilm-$1.00 - Photostat-$4.00
This is a basic stock list and addendum of parts for Continental engines, machine prepared and arranged in numerical order. It is the official stock list publication listing the equipment and supplies procured, stored and issued by the AAF for this class.

PB 34417. U. S. ARMY AIR FORCES. Parts for Franklin engines. (Stock List 02-F) May 1946. 40 p. Price: Microfilm-$1.00 - Photostat-$3.00
This stock list of parts for Franklin engines is arranged in numerical order. It is the official stock list publication listing the equipment and supplies procured, stored and issued by the AAF for this class.

PB 34510. U. S. BUREAU OF AERONAUTICS. Bendix service manual for hand operated hydraulic control valve, part no. 79720. (Manufactured by Bendix Aviation Corp., Bendix Products Div., South Bend, Ind.). (NAVAER 11-1-507) n. d. 19 p. Price: Microfilm-$1.00 - Photostat-$2.00
This manual contains a description and instructions for installation, operation, servicing and overhaul of the Bendix gun charger cylinders gun charger control valves. There is a parts list. Photographs and drawings illustrate the manual.

PB 34811. U. S. BUREAU OF AERONAUTICS. Handbook of instructions: McCord expended link ejection heads and chutes. (NAVAER 11-1-506) Apr 1944. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00
This handbook contains descriptions of, and instructions for the installation of expended link chute assemblies which are designed for mounting on the caliber .50 aircraft machine gun, M2. Drawings illustrate the handbook.

Airports and Airways

PB 38189. ALLGEMEINE ELEKTRICITÄTS-GESELLSCHAFT, BERLIN. AEG-Zeiss luft-verkehrs-signale. Leuchtfeueranlagen für luftverkehr (AEG-Zeiss air communication signals. Light beacons for air communication). n.d. 17 p.
Price: Microfilm - $1.00 - Photostat - $2.00
A catalogue of airport and flight-line light signalling equipment including computations for required energies, towers, motor-generator sets and high powered search-lights. Photographs, tabulations and graphs included. In German.

PB 34052. U. S. ENGINEER BOARD. Report on an investigation to determine the relation between the strength of individual welds and welds in a full panel of bar and rod airplane landing mat. Jul 1943. 27 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report gives the results of an investigation to establish the relation between the strength of individual welds tested after being cut from the panel and welds tested in the full panel. The investigation was initiated in order to accumulate factual data on which to base recommendations for revising bar and rod landing mat specifications. Many photographs and statistical tables are included in the report.

Aerodynamics

PB 36481. BARTSCH, E. Einfluss der schaltzeit auf die rollbewegung und die tragwerksbeanspruchung bei querruderbetätigung. (The influence exerted by the time factor associated with the shifting of the aileron, on the rolling motion and the wing-assembly stress of aircraft.) (Deutsche Luftfahrtforschung FB 991) Nov 1938. 59 p. Price: Microfilm-$2.00 - Photostat-$4.00
This report from the "Institut für Flugmechanik der Deutschen Versuchsanstalt für Luftfahrt, E.V." shows in particular how the angular acceleration, the angular velocity, and the angle of roll depend on the manner of, and time involved in, shifting the aileron. The report also defines a number of magnitudes by means of which it is possible to express the aileron efficiency numerically. Graphs, tables, and a bibliography are included.

PB 36483. FUCHS, R. Neue berechnung des abwindes in der umgebung eines tragflügels (New method of computing the downwash in the vicinity of an aircraft wing). (Deutsche Luftfahrtforschung FB 1097) Sep 1939. 50 p. Price: Microfilm-$1.00 - Photostat-$4.00
This report from the "Luftfahrtforschungsanstalt Hermann Göring, Braunschweig" discusses a new method and gives formulas for computing the velocity of the downwash at and near airfoils. Graphs and tables are included.

PB 33113. GILMORE, J. H. High-speed wind-tunnel research at Yokosuka. (AAF T-2 Air Tech Intelligence Review F-IR-56-RE) Jun 1946. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report based on an interview with Comdr. T. Toda, at Yokosuka lists the general characteristics of the two high-speed tunnels. The small tunnel (one-third scale model of 1-m tunnel) was put in operation in 1942, and originally was built to study flow conditions that could be expected in the larger tunnel. Due to the accelerated need for high-speed research the tunnel was utilized for research in wing profile, interference effects and fuselage shapes. The 1-m tunnel was put in operation late in 1943, and compressibility effects and shock-wave phenomena had the highest priority for tests in this tunnel in 1944 and 1945. The interviewing officer concluded that the equipment and methods used in high-speed research compared very favorably with facilities in the United States, and that the Japanese understood the problems of design control of high-speed aircraft.

PB 36153. GOTHERT, RUDOLF and GIESE, F. Kritische betrachtung der verschiedenen aerodynamischen ruder momentenausgleiche von höhenleitwerken (Critical consideration of the various aerodynamic compensations for control-surface moments of elevator assemblies). (Deutsche Luftfahrtforschung FB 1534) Dec 1941. 41 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report from the "Luftfahrtforschungsanstalt Hermann Göring, Institut für Aerodynamik" compares, with respect to their aerodynamic characteristics, the now customary tail-unit constructions with tail units of extremely small control-surface chord depth, particular emphasis being placed on the losses in control-surface efficiency resulting from the aerodynamic control-surface-moment compensations. Diagrams and graphs are included.

PB 36127. IGLISCH, R. Über eine anwendung der Eulerschen summenformel auf ein problem der aerodynamik (On the application of the Euler sum formula to an aerodynamics problem). (Deutsche Luftfahrtforschung FB 1736) Feb 1943. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
This German report from the "Technische Hochschule Braunschweig gives formulas for computing the increase in efficiency resulting from a number of aircraft flying in a suitable group formation rather than individually. This saving is explained by the fact that the aircraft in the rear, fly in the induced upwash of the preceding aircraft. Diagram, graph, and a bibliography are included.

PB 36128. MARQUARD, E. and CAPELLEN, W. MEYER ZUR. Näherungsweise berechnung der zwischen fahrgestell und rumpf beim landen auftretenden federkräfte. (Approximate computation of the elastic forces occurring during the landing of an aircraft between the landing-gear frame and the fuselage). (Deutsche Luftfahrtforschung FB 1737) Dec 1942. 58 p. Price: Microfilm-$2.00 - Photostat-$4.00

This German report from the "Institut für Kraftfahrwesen der Technischen Hochschule Aachen" discusses methods and gives formulas for computing the forces coming into play during the landing of an aircraft. Diagrams, graphs, and a bibliography are included.

PB 20501. SCHILHANSL, M. Untersuchung an 5 Joukowsky-profilen (A study of five Joukowsky airfoil profiles) (ZWB Forschungsbericht 116) n. d. 36 p. Price: Microfilm-$1.00 - Photostat-$3.00
This is a report of the "Deutsche Versuchsanstalt für Luftfahrt E. V., Berlin-Adlershof". In an experimental approach to the question of the prediction of airfoil characteristics a study is made of five profiles of which four are derived through systematic changes of a Joukowsky profile. The examination includes tests of lift, pressure distribution, and profile resistance. The report includes a discussion in which a comparison is made of observed measurements with the theoretical lift and the theoretical pressure obtained under the assumption that the fluid was nonviscid. Graphs, drawings and bibliographic footnotes are included.

PB 31075. SCHWEITZER. Researches into the behavior of sections of the covering of the control surfaces in different designs carried out in the supersonic wind tunnel. Jan 1943. (BIOS Halstead Exploiting Centre Rept 304) May 1946. 41 p. Price: Microfilm-$1.00 - Photostat-$3.00
This is a translation of a German report on research carried out at the Heimatartilleriepark Aerodynamic Institute Research Laboratory. Thin sheets of metal exposed to various loads were tested to determine the frequency of their vibrations in a supersonic wind tunnel. Photographs were taken by slow motion camera to record the vibrations. The tests and results are described. The report is well illustrated with photographs of the metal during and after the tests. Also included is a graph to illustrate the frequency of vibrations under various velocities. Although the type of material is not mentioned in the report, size and thicknesses are given.

Rockets and Jet Propulsion

PB 30936. BUSEMANN, A. Report on the Paul Schmidt jet tube propulsion. German aeronautical research report FB 530. Feb 1936. (BIOS Halstead Exploiting Centre Rept 579) May 1946. 36 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report from the German Institute for Aeronautical Tests, E. V., originally published in Dec 1936, gives a short review of the working principles and the capacity of the Schmidt jet engine propulsion. This paper on the jet engine developed by Paul Schmidt includes discussion of jet tube (engine) propulsion, dimensions of the jet tube, fuel consumption, weight of the tube, efficiency of the released fuel energy and of the introduced kinetic energy, calculations of velocity, and the prospects of jet tube propulsion. In contrast to the engine and propeller combination, the jet tube possesses at low speed, a lower degree of total efficiency because the combustion takes place at constant volume without preliminary compression. It has on the other hand, a lower weight and can be constructed for an equal degree of efficiency for higher flying speeds up to about twice the velocity of sound. Diagrams and some drawings are included to enable comparison to be made with other means of propulsion.

PB 30980. CORRELL. Research on guiding an A. A. rocket by beams. May 1945. (BIOS Halstead Exploiting Centre Rept 116/111) May 1946. 70 p. Price: Microfilm-$2.00 - Photostat-$5.00
This is a translation of a German report. The object of the research was to devise a system of guiding a rocket to an aircraft traveling at a great height by means of an electronic beam between the ground transmitter and the aircraft. The ideal rocket trajectory is, therefore, a so-called three point curve in which the ground transmitter, the rocket, and the target coincide constantly in a straight line. This document is a detailed analysis of the aerodynamic considerations involved in the motion of such a rocket from ground to target.

PB 30956. KLEMPERER, W. B. Survey of facilities in Germany for development of guided missiles. Part IV. Sep 1945. (BIOS Halstead Exploiting Centre Rept 5786) May 1946. 51 p. Price: Microfilm-$2.00 - Photostat-$4.00
In this report is presented pertinent information regarding the problems and projects carried on at the various control system laboratories. These problems were mainly that of (1) stabilization, which automatically preserves certain flight parameters, (2) seekers, which automatically seek out a target and direct a missile towards it, (3) command links, by means of which control can be transmitted from an extraneous command post, (4) command execution by means of which such signals are received, digested and applied and (5) training devices by means of which the involved relationships governing remote and automatic control of a guided missile can be studied by the designer of the missile system as well as by its user. Other parts of the survey appear in the bibliography as follows: Part I - PB 25036, Part II - PB 28649, Part III - PB 27748, Part V - PB 30957, Supplement 2 and 3 - PB 28834.

PB 30957. KLEMPERER, W. B. Survey of facilities in Germany for development of guided missiles. Part V. Sep 1945. (BIOS Halstead Exploiting Centre Rept 5787) May 1946. 26 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report deals with the development and fabrication of complete missiles. Apparently none of the German guided missiles were developed in its entirety by a single organization. Most of them required some coordination. In all instances the manufacturer of the air frame was responsible for the coordination. In some instances timing of the contributors did not work out well and there were cases of buck-passing after trouble arose. This report briefly recapitulates the use of the various facilities arranged by missile projects although some repetition of information contained in earlier parts of this report was inevitable. The material is arranged in categories of: Steep glide bombs of limited control, flatter glide bombs, self-sustained horizontally flying bombs, steeply climbing and vertically ascending anti-aircraft, and long range ground-to-ground rockets. This treatment also reflects roughly the history of the development. Other parts of this survey appear in this bibliography as follows: Part I - PB 25036, Part II - PB 28649, Part III - PB 27748, Part IV - PB 30956, Supplements 2 and 3 - PB 28834.

PB 33114. WATTENDORF, F. L. and MORSE, J. H. Development of gas turbine propulsion in Japan. (AAF T-2 Air Tech Intelligence Review F-IR-57-RE) Jun 1946. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00

According to Commander Osamu Nagano, the original stimulus to the development of jet propulsion in Japan was supplied by Rear Admiral Hanejima, head of the Engine Division, First Air Technical Arsenal, Yokosuka, who about 1936 became interested in patent literature of Goddard, Whittle and Campini. In 1938 Captain Tanegashima replaced Hanejima and actively sponsored the development of jet propulsion. His first effort centered on the free piston type of gas generator, then the axial compressor applied to gas turbine-propellor systems, and finally turbojets, especially the Ne-20. Commander Nagano built the first operating model of a free piston type gas turbine in 1941, and has been the project officer responsible for the development of the Ne-20 under Captain Tanegashima. Brief chronological review of Japanese jet-propulsion development and principal characteristics of the Ne-20 as given by Commandor Nagano are given.

LAND TRANSPORTATION

PB 18421. BUCKEL. Bericht A 200 R/1944 über besprechung bei der RBD Villach wegen des einsatzes von verfahren zur streckensicherung (Report A 200 R/1944 about a conference at the railroad directional office Villach about the testing of methods for rail security). (ALSOS Mission, RFR 302b) Aug 1944. 3 p. Price: Microfilm-50¢ - Photostat-$1.00

PB 30251. DUPPSTADT, H. D. First report on test of truck, cargo, 10-ton, 6 x 4, T48; eleventh report on ordnance program no. 5732; and first report on ordnance research & development center, project no. 6340. (Aberdeen Proving Ground Rept 5732/11) May 1946. 39 p. Price: Microfilm-$1.00 - Photostat-$3.00
This is a study of truck transportation and truck requirements in the China, Burma, and India theatre, particularly on the Burma and Ledo roads. The group made studies of transportation, existing road conditions and average bulk and weight of cargo hauled, then designed a special truck with a 20 foot cargo body, using the front end of a 5-ton 4 x 2 Tractor, Light, and the rear frame and bogie of a Truck, 4-Ton, 6 x 6. It was felt that this could replace two or more trucks that were in current use for this transportation. Some design changes for greater strength and performance are recommended. Some testing of the truck is reported, but the end of the war curtailed the great need for these trucks. Many photographs are included.

PB 18427. GERMANY. ELEKTROTECHNISCHES VERSUCHSAMT DER REICHSBAHN. Bericht A 171 V/1943 über messungen an einer streckenüberwachungsanlage (Report A 171 V/1943 about control measurements of a railroad installation) (ALSOS Mission, RFR 302B) Oct 1943. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
The report describes tests for finding suitable means for track control in occupied territory by measuring d.c. changes as result track interruptions. The appendix contains diagrams of different switching arrangements and tabulations of measurements. In German.

PB 18419. GERMANY. ELEKTROTECHNISCHES VERSUCHSAMT DER REICHSBAHN. Bericht A 198 V/1944 über gleisüberwachung mittels spannungsstössen (Report A 198V/1944 on track surveillance by means of current pulses). (ALSOS Mission, RFR 302B) Aug 1944. 21 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes the development and test results of an equipment built for determining from a central point any sabotage on the track within a range of about 5 km by means of measuring and comparing short d. c. pulses sent through the tracks. Graphs and circuit diagrams appended. In German.

MARINE TRANSPORTATION

PB 19359. DIRECTIVES and materiel lists for German Navy installations. (ALSOS Mission, Microfilm 41-1) 1932-1941. 220 p. Price: Microfilm-$3.00 - Enlargement print-$15.00
This report is a collection of a number of materiel lists pertaining to the maintenance of submarine destroyers. It also contains an operating procedure of the "Office of the 2nd Admiral of Submarines", and a set of diagrams and blue prints of the electrical system of the destroyer Z37-39 of the German Navy.

PB 30642. U. S. ARMY. FORCES IN THE PACIFIC. Japanese stream crossing equipment. (Engineer Technical and Technological Survey, Mar 22, 1946). Mar 1946. 114 p. Price: Microfilm-$3.00 - Photostat-$8.00
This report considers Japanese stream crossing equipment other than that designed primarily for bridge building. It is limited therefore to that equipment, the military characteristics for which are dependent not on the width of streams, but on single trip carrying capacity, in certain specified types of waterways. In addition to examination and description of the equipment itself, which is carried into detail only on the more modern and more interesting pieces of equipment, the general scheme of procurement, fabrication, and supply is covered briefly, as well as is development. Their pneumatic raft, an original idea, which enables tank carrying displacement to be effected with a nonrigid structure, is considered their outstanding development. Pages 76-89 are missing from the report, including appendices A, B and C. Appendix D covers railway ferries; appendix E, the M-99 portable inboard propulsion unit; appendix F, the horizontal shaft outboard motor; and appendix G, the rocket powered propulsion unit. Tables, photographs and schematic diagrams are included.

PB 33500. U. S. NAVAL ORDNANCE LABORATORY. The extrapolation of the vertical component of the magnetic field beneath a ship. (Mine Unit Rept 175) Jan 1941. 45 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report provides numerical methods of routine character for the extrapolation of the vertical component of the magnetic field beneath a ship. Measurements of the vertical component of the ship's field are time consuming and expensive. For this reason it is considered advisable to have methods for extrapolating the field in a downward direction using signatures obtained on one range. Routine methods of performing the extrapolation are outlined in the report. Discussion is presented on the general theory including the fundamental relation of the problem of extrapolation to that encountered in geophysics. Method used here is based on the

same mathematical relation as has been used by Bardeen in geophysics. Discussion are also presented on: Qualitative considerations regarding smoothness, the inverse square law, limitations due to incomplete measurements, computation of tables, and the use of tables. Graphs, charts and tables are included.

MISCELLANEOUS

PB 18518. BERGWERKSCHAFTLICHE VERSUCHSSTRECKE, DORTMUND-DERNE. Bescheinigung über die prüfung des minenprüfers type Z.E.B.H. der Firma Zünderwerke Ernst Brün K. G., Krefeld-Linn, and supplement 1, dated Oct 4, 1934. (Test certificate for mine-tester type Z.E.B.H. from the firm Zünderwerke Ernst Brün K. G. Krefeld-Linn and supplement I dated Dortmund-Derne Oct 4, 1934). (MIS VII 67b 7002460) Jul 1930. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Description of the mine-tester is given in the certificate dated July 26, 1930, and description of the safety test in supplement I. This is a device for use in mining practice.

PB 33307. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 301. Mar-Apr 1946. 11 p.
Price: Microfilm-$1.00 - Photostat-$1.00
This is a condensation of B.I.O.S. Reports Nos. 5043-5058 regarding various plants visited in Germany. The name of each plant, its location, personnel seen, summary of final report, condition of plant and period to start production where given, are listed. Following are the names of plants and locations, with products and special features, if any, in parentheses: W.U.M. Osterman, Wuppertal-Barmen (cable insulating machines); Felten & Guilleaume, Cologne Mülheim (cable making machines); Kabelwerke Rheydt A. G., Rheydt (cable insulating machine and enamelling plant); Vorwerk V. Sonn, Wuppertal-Barmen (braiding machines); W. Körting, Wuppertal-Barmen (repair of braiding machines); Joh. Fries, Wuppertal-Barmen (repair & manufacture of braiding machines); Von Aachton, Krefeld (silk braided elastic); Paul Trüster, Hannover-Wullfel(rubber & plastic extruding machines);Prometbus Werke A. G.,Hannover (cable drying & oil impregnating plant); Herman Berstoff Maschinenbau-Anstalt G.m.b.H., Hannover(covering high tensile wire with plastic); Niehaus & Luck, Düsseldorf (cable insulating machine manufacture); Emil Kremzler, Wuppertal-Barmen (braiding machines); Weber & Schultz, Hamburg (sheeting, tubing & molding of plastics); New York Hamburger Gummiwaren Compagnie, Hamburg (ebonite goods); H.Rost & Co., Hamburg (soling sheet for footwear & plastic tubing); and Nord Gummi, (equipment for production of molded soling sheets, soles & heels).

PB 33309. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 314. Mar-Apr 1946. 11 p.
Price: Microfilm-$1.00 - Photostat-$1.00
This is a condensation of B.I.O.S. Reports Nos. 5198-5208 regarding various plants visited in Germany. The name of each plant, its location, personnel seen, summary of final report, and condition of plant and period to start production where given, are listed. Following are the names of plants and locations, with products and special features, if any, in parentheses: Kalker Triefurfabrik Mayer & Cie, Heumar bei Köln (steel sheeting); Ruhrstahl A. G. Stahlwerk Krieger, Düsseldorf (steel founders); Vereinigte Aluminiumwerke Werk Lünen, Lünen (reduction plant); Deutsche Edelstahlwerke, Remscheid (crankshafts); Press u. Walzwerk A. G., Düsseldorf-Reisholz (pressure vessels); Gutehoffnungshütte Oberhausen A. G., Oberhausen (railway tire, wheel & axle shops); Ruhrstahl Henrichshütte (formerly owned by Henschel), Hattingen (railway tire, wheel & axle plant); Dortmund-Hörder Hüttenverein, Dortmund (tire & axle forgings); Bochum Verein Hontrop, Bochum (railway tire plant); Krupp Gusstahlwerke, Essen (railway tire & wheel shops); and Krupp Gusstahlwerke, Essen (wheel & axle production).

PB 33311. BRITISH INTELLIGENCE OBJECTIVE SUB-COMMITTEE. Preliminary reports list no. 324. Mar-May 1946. 11 p.
Price: Microfilm-$1.00 - Photostat-$1.00
Summaries of BIOS interim reports Nos. 5332 to 5342, inclusive, on German industry present in tabular form, name of each factory visited, location, condition, and principal products, as follows: Spangenbergwerke G.m.b.H. Schnackenburg, (20% damaged, production of by product oils from wood pulp); Heinrich Olschlager, Cologne, (undamaged, flux for castings); Deutsche Edelstahlwerke, Willich, near Krefeld, (partly destroyed, chromising process); Bergische Stahlindustrie, Remscheid, (10% operative, chemical laboratory); Alexanderwerke A. G., Remscheid, (20% operable, mechanical plant testing equipment); P. Bennhütter, Rattenhorst, Weidenbrück, (undamaged, binder twine); Deutsche Edelstahlwerke, Remscheid, (35% operable, laboratory equipment and crankshafts); Gierresheim Glaswerke A. G., Gerresheim near Düsseldorf, (production 1/3 capacity, glass rolling machines); Klingelberg-Berfhausen, Remscheid (in production, rotary slitting machines); Westfalia Separator A. G., Olde, (undamaged, milk separators); Heinrich Puth, Blankenstein, (wire cables); Rhein-Mühlen A. G., Düsseldorf-Benrath, (undamaged, pearl barley); Fortin-Werke, Düsseldorf (partly damaged, grain processing); and Ördingen Malzkaffee & Rollgerste Fabrik, Ördingen, (undamaged, grain processing).

PB 33313. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 326. Mar-May 1946. 8 p.
Price: Microfilm-$1.00 - Photostat-$1.00
Summaries of BIOS interim reports nos. 5354 to 5364 inclusive on German industry present in tabular form, name of each factory visited, location, condition, and principal products, as follows: Losenhausenwerke Düsseldorf, (undamaged, metal testing machines); Alb. v. Tarnegrocki, Essen (metal testing machines); Siemens Halski Research Laboratories, Berlin, (one-third damaged, aluminum powder detector); Claudius Peter A. G., Hamburg, (good condition, consulting engineers constructors and marketors for Fuller mill); Conz Elektrizitäts-Werke, Hamburg, (30% destroyed, electrical motors); I.G. Farbenindustrie, Leverkusen, (undamaged, production of synthetic rubber); Continental Gummiwerke A.G., Hannover, (85% damaged; research on rubber machinery); H. Hellemann G.m.b.H., Elverdissen, (undamaged, linoleum production); Continental Gummiwerke, Hannover, (badly damaged, manufacture hose and rubber conveyor belts); Hermann Berstorff, Hannover, (undamaged, machinery for rubber manufacturers); and Max Müller, Hannover (cutting machines).

PB 36812. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE Preliminary reports list No. 335. Apr-May 1946. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a condensation of B.I.O.S. reports Nos. 5445-5454 regarding metal product plants visited in Germany. The name of each plant, its location, condition, personnel seen, date of investigation, equipment to be evacuated, and brief summary of final report data regarding products, equipment and methods where given, are listed. Following are the names of plants and locations, with products in parentheses:

Mannesmann Rohrenwerke Abteillung-Rath, Düsseldorf (steel tubes, drums, etc.); I.G. Schwietzke, Düsseldorf (steel castings); Press- und Walzwerk A.G., Düsseldorf/Reisholz (steel tubes and pipes); Otto Fuchs, Meinerzhagen/Westfalen. (rods, pipes & die castings); Reichswerke Watenstadt, location not given (blast furnace); Deutsche Maschinenfabrik A.G., Düsseldorf-Benrath (cranes, bridges & mining machinery); Wagner Hochdruck Dampfturbinen KG, Hamburg (boilers & furnaces); Hochfrequenz Tiegelstahl GmbH, Bochum (special steel castings, etc.); Götzwerke Friedr. Götze A.G., Burscheid bei Düsseldorf (piston rings); Deutsche Röhren Werke A.G., Mülheim/Ruhr (steel tubes & boilers).

PB 34054. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list No. 339. Apr-May 1946. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
Summaries of BIOS interim reports Nos. 5485 to 5494 inclusive on German industry present in tabular form, name of each factory visited, location, and principal products, as follows: Deutsche Schiff - und Maschinenbau A.G., Bremen, (high pressure boilers); L. & C. Steinmüller, Gummersbach K.N.H. of Cologne, (steam boilers); Albert Strassmann, Remscheid Ehringshausen, (microscope tools and locomotive repairs); Bergische Stahlindustrie A.G., Remscheid, (metallurgical machinery); Dortmund Herder Hüttenverein, Dortmund, (forged and cast steel products); Vereinigte Leichtmetallwerke A.G., Bonn, (steel sheeting, stampings and castings); Ruhrstahl A. G., Annen (steel castings); Ruhrstahl A. G., Witten, (forgings, steel rods, etc.); Gutehoffnungshütte Foundry, Oberhausen, (ingot moulds and general castings); and Ruhr-Stahl Stahlwerk-Krieger, Düsseldorf, Oberkassel, (steel works).

PB 33316. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 350. Apr-May 1946. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
Summaries of BIOS interim reports nos. 5401 to 5410 inclusive on German industry present in tabular form, name of each factory visited, location, condition and principal products, as follows: Friedrich Alfred Hütte (Krupp), Rheinhausen, (15% damaged, Steel Works); Klockneerwerke A. G., Georgsmarienshütte, (operable 100%, steel rolling mills); Dortmund Hörder Hüttenverein A. G., Hörde, (fair condition, rolling mills); Gutehoffnungshütte, New Oberhausen, (damage to roof only, hot rolled sections and bars); August Thyssen-Hütte A. G., Hamborn, (considerable damage, hot rolled sections and bars); Ministerstein Colliery, near Dortmund, (mine car controls); Sachsen Colliery, near Ham (general mine control); Drunninghaus Werke, Westhofen, (mine car design and construction); and E. D. Dörrenberg Söhne, Runderoth, (tool steels).

PB 36811. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list No. 391. Jan-May 1946. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a condensation of B.I.O.S. reports nos. 6035 - 6040 regarding certain research workers and plants visited in Germany. The name and location of the individual or plant are given, as well as condition of plant and period to start production where listed. Following are the names of individuals and plants and locations, with products and special features in parentheses: Dr. Kalkner, A.E.G., Berlin (research); Tefi Apparatenbau, Pers (portable midget wireless sets); Heinrich List, Berlin (electric instrument manufacturer); Dr. Peter Lange, Wentorf nr. Bergedorf (research in aerial design; guided missiles); Dr. W. Deutschmann, Berlin-Siemensstadt (rectifiers); Telefunken-Gesellschaft für Drahtlose Telegraphie GmbH, Schöneberg, Berlin (radar).

PB 36828. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list No. 394. May 1946. 16 p. Price: Microfilm-$1.00 - Photostat-$2.00
Summaries of BIOS interim reports Nos. 6064 to 6085 inclusive on German industry present in tabular form, name of each factory visited, location, condition, and principal products, as follows: Villbrandt Zehnder, Elberfeld, (Weaving Dpt. destroyed, rest undamaged, Mfg. braiding); Hugo Schaffeld, Peine, (Undamaged, Mfg. floor cloth); Heinrich Schulze, Goslar, (Undamaged, Mfg. quilts and mattresses); Roweder, Neumünster, (Badly damaged, Mfg. carding machines); Schulenburg & Vick, Minden, (Undamaged, Mfg. mattress machines); Scheidemandel Motorde Werke, Minden, (Damage to roof and buildings, Mfg. high grade glue); H. A. Schmitz, Wuppertal-Barmen, (original factory destroyed partly rebuilt, Mfg. artificial flowers and rose bud trimmings); Schragbandfabrik am Scherping, Hamburg, (No report given, Mfg. bias binding); Arthur Schaper, Wuppertal-Barmen, (Destroyed, Mfg. braces men's wear); Letzer & Heiman, Essen, (Undamaged, can production); H. Oppermann, Minbeck, (Undamaged, Mfg. lampwicks); Halstenbach & Co., Wuppertal-Barmen, (Destroyed, repairs to winding machines); Halstenbach & Co., Wuppertal-Barmen, (Partly destroyed, dyeing, finishing, braiding); Kausch H. Co. Chemische Fabrik, Lüneburg, (Slight damage, soap manufacturer and homemade cheese); Wilhelm Quadt Maschinenfabrik, Wuppertal-Elberfeld, (Slight damage, manufacturing machines for fabrics); L. Gusbusch & Söhne Nachfolger, Wuppertal-Longerfeld, (Destroyed, manufacturing ribbons); Wilhelm Reising, Wuppertal-Barmen, (Partly rebuilt, lace production); Richard Weigandt, Wuppertal-Barmen, (Undamaged, mfg. tagging machines- no production); A. Rollinghoff, Schwela, (60% destroyed now rebuilt, ribbon weaving); Rost & Co., Harburg nr. Hamburg, (Undamaged, mfg. canvas belting); and Rothschild Gebrüder & Co., Wuppertal-Barmen, (Completely destroyed, no trace or record of this target).

PB 36824. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 404. Apr-Jun 1946. 7 p. Price: Microfilm - $1.00 - Photostat - $1.00
Summaries of BIOS interim reports nos. 6180 to 6189 inclusive on German industry present in tabular form, name of each factory visited, location, condition, and principal products, as follows: Deutsche Erdöl A.G., Hamburg, (Badly damaged, Oil production); Rhenania-Ossag Mineralölwerke A.G., Hamburg, (Badol damaged, Oil production); Steinkohlenberg Werke Rheinpreussen Chemische Werke, Moers, (Fair amount of damage, synthetic products); Dortmunder Paraffin Werke G.m.b.H. and Hoesch Benzin G.m.b.H., Dortmund, (Severe damage, no production); Rhenania-Ossag Mineralölwerke, Hamburg, (Partly destroyed, solvent refining); Deurag-Nerag, Hannover, (Working, Dewaxing plant); Eisenwerke, Wanheim nr. Duisburg, (condition good, railway rails); Perm. Way Depot and Shops, Witten nr Essen, (operating, railway equipment); Hamburg Reichsbahn, Hamburg, (condition fair, Railway equipment); and Busch-Jaeger, Lüdenscheid, (Undamaged, Mfg. plugs and sockets for aircraft use).

PB 36826. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 405. May-Jun 1946. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
Summaries of BIOS reports Nos. 6190 to 6202 inclusive on German industry present in tabular form, name of each factory visited, location, condition, and principal products, as follows: Ludwig Sinons, Neumünster, (Very good conditions, Mfg. of blankets); Villbrandt & Zehnie A.G., Wuppertal - Elbesfeld, (Undamaged, Plastic braids and card wrapping machines); Chemische Fabrik Billwärder, Billbrook, Hamburg, (Damage negligible, Preparation of carbondisulphide); A.G. für Chemische Industrie, Gelsen Kirchen, (More or less damaged, production of chemicals CS_2 etc. improved retorts for feeding

of molten sulphur); Busselman, Essen Kupferdreh, (Semi permanent moulding materials); Gebrüder Huffenes, Düsseldorf - Heerdt, (Destroyed in 1942 partly rebuilt, Mfg. of core oils, core binders, parting powders); Zinkweiss Fabrik, Hamburg, (Mfg. Zinc Oxide); Harold Hackländer, Wermelskirchen, (Undamaged, Mfg. table covers, plush mats, and motor rugs); Herman Schopp, Wermelskirchen, (Undamaged, plush manufacturer); Harzer Hosenträger-u-Gürtelfabrik, Hohn, (Undamaged, braces, belts, etc.); Hassenklever & Hüser, Wuppertal-Beyenberg, (Undamaged, cotton yarn); Christian Heikaus, Wuppertal-Wichlinghausen, (Undamaged, trimmings, hair net material, and millinery material); and Heinemöller & Dieckershoff, Wuppertal-Barmen, (100% damaged 25% repaired, braces men's wear).

PB 36825. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 406. Apr-May 1946. 10 p. Price: Microfilm - $1.00 - Photostat - $1.00
Summaries of BIOS interim reports nos. 6203 to 6211 inclusive on German industry present in tabular form, name of each factory visited, location, condition, and principal products, as follows: Schumag, Aachen, (Mfg. fishing tackles to needle rollers for bearings); J. A. Henckels, Solingen, (Partly damaged, Mfg. of magnets.); Haltermann & Co., Hamburg, (Badly damaged, Tar distillery); W. Hellsson, Essen Werden, (Factory in Essen totally destroyed, Mfg. Theodolites); O. Kullenburg, Essen, (Totally destroyed, Photo engraving photostats enlargements etc.); Pyro Werke G.m.b.H., Deister Wennigsten-Hannover, (Undamaged, temporary measuring instruments, optical instruments, optical pyrometers); J. G. Peiselier, Remscheid, (Special instruments, Vernier Calipers); Carl Kind junior, Bielefeld, (Fully destroyed, printing plates); and Dreyer, Rosenkranz & Droop A. G. Hannover, (Operable, Mfg. pressure gages and records, pressure gage testers, and instruments for testing elasticity of rubber).

PB 36823. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 407. May-Jun 1946. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
Summaries of BIOS interim reports nos. 6212 to 6222 inclusive on German industry present in tabular form, name of each factory visited, location, condition, and principal products, as follows: Dr. Georg Henning, Berlin, (Equipment looted, mfg. of adenosine and adelylic acid from yeast); Verlag von Julius Springer, Berlin, (operable, publisher of technical books); Schering A. G., Berlin, (50% damaged, preparation of atophan and liver extract and sulphonamides); Nordmark Werke, Uetersen-Holstein nr. Hamburg, (Undamaged, preparation of sulphonamides and sulphur pyridine, sulphacetamide and sulpheo-nanidine); Sirius A. G., Düsseldorf, (Badly damaged, no report); Deuel & Kreuer, Cologne, (Partly damaged, no report); Jaeger, Wuppertal, (Slight damage, production of taper and parallel rollers for inspection of bearings); Riedel de Haen, Hamburg, (70% destroyed, mfg. fine chemicals); Dolomit Werke G.m.b.H., Hagen, (Undamaged, mfg. dolomitic lime for agriculture and buildings); Didier Werke, Godesberg, (Undamaged, firing of refractory bricks and shapes); and Gebrüder Langen, Erkrath near Düsseldorf, (Undamaged, refractory materials for steel foundries).

PB 36822. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list No. 409. May-Jun 1946. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
Summaries of BIOS interim reports Nos. 6233 to 6242 inclusive on German industry present in tabular form, name of each factory visited, location, condition, and principal products, as follows: Fritz Biersmann, Wuppertal-Langerfeld, (Slightly damaged, Plain ribbons for aprons); Ewald Blasberg, Wuppertal-Oberbarmen, (75% damaged, repairs of ribbon looms); Brückner & Co., Wuppertal-Wichl, (Undamaged, men's braces); Schwartz & Klein, München-Gladbach, (Slight damage, Suitings, Womens cloths & upholstry for motor cars); Fdr. Köster, Neumünster, (good condition, blankets and uniform cloths); Edm. Finkensieper, Barmen, (60% destroyed, inactive); Frowein & Co., Wuppertal-Barmen, (Undamaged, rayon etc.); Frowein & Sohn, Wuppertal-Barmen, (Undamaged, webbing); Wilhelm Ruppert, Wahn-Rheinland, (10% damaged, textile machinery); and Essmann & Grimm, Wuppertal-Barmen, (Undamaged, braces and weaving webs).

PB 36810. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list No. 419. May-Jun 1946. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a condensation of B.I.O.S. reports Nos. 6366 - 6376 regarding certain factories visited in Germany. The name of each plant, its location, condition, personnel seen, date of investigation, and brief summary of final report giving machinery and period to start production where given, are listed. Following are the names of plants and locations, with products and special features, if any, in parentheses: F. Haas, Lennep (dryers); Fr. Wilh. Voos, Solingen Wald. (not producing); Karl Hagebeuker, Phanomen, Solingen (cutting caps for electric clippers); Goerts, Clay, München-Gladbach (cloth and carpets); Plüschweberei, Grefrath, Kempen (velvets, furnishing and mantle plushes); Niedieck & Co., Lobberich, Kempen (art silk plushes, ribbon velvet, and plushes); A. G. Hoffman, Cleve (children's shoes); Gebr. Holzeman, M. Gladbach (art silk, plushes); Krawinrel & Schnabel, Gummersbach (woolen yarn spinners); Adolf Floring, Wirmelskirchen nr. Düsseldorf (shoes); Meridian Schuhfabrik, Bahrenfeld (shoes). Brief reports on B. J. Wilkens, Horstel, Mecklenburg, and Heinrich Fruse, Neumünster, are also included.

PB 26814. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 420. May-Jun 1946. 10 p. Price: Microfilm - $1.00 - Photostat - $1.00
This is a condensation of B.I.O.S. Reports Nos. 6377-6386 regarding certain steel works and plants visited in Germany. The name of each plant, its location, condition, period to start production, personnel seen, date of investigation, and brief summary of final report regarding products, and sometimes equipment and methods are listed. Following are the names of plants and offices and locations, with products and special features, if any, in parentheses: Kloss Prinz Steel Works (steel tubes); Poppe & Potthoff, Bielefeld (steel tubes); Postels Spritzgusswerke, Cologne-Hohenberg (clipper levers); Franz Voos Söhne, Atlas Werke, Solingen (clipper levers); Schirmfurnituren - Verband, Solingen-Ohlig (sales office for umbrella components); Graatorf Ltd., Hannover (concrete materials, concrete pipes, hollow roofing slabs); Bremshey & Co., Solingen-Ohlig (umbrella fittings, welded steel tubes, tubular bedsteads); D. H. Remp & Söhne, Altena, Westf. (wire drawers and umbrella ribs); Selenium Rectifier Developments, AEG, Soest (dry plate rectifiers); W. Bauermann & Söhne, Hilden, Rhineland (umbrella components, and tubular bicycle parts).

PB 36929. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 427. Apr-Jun 1946. 14 p. Price: Microfilm-$1.00 - Photostat-$1.00
Summaries of BIOS interim reports nos. 6455 to 6467 inclusive on German industry present in tabular form, name of each factory visited, location, and principal products, as fol-

lous: Hydrawerke A. G., Berlin (Impregnation of metallized paper capacitors); Hydrawerke A. G., Berlin, (Mfg. of electrical capacitors); Siemens Halske Werner Werke, Siemensstadt, Berlin, (Projectors); Technische Hochschule, Aachen, (Electron microscope); Hüth Apparat Fabrik, Hannover-Linden, (Receivers); Materialprüfungsamt, Berlin, (Testing rolled steel sheets for lamination and testing manufactured parts by accustic resonance); Siemens Apparat und Maschinen G.m.b.H., Berlin-Mariensfelde, (Design, development, processing and testing of plugs, sockets and R/F connections); Lorenz, Berlin-Tempelhof, (Electrical Engineers); und Telefunken-Gesellschaft für Drahtlose Telegraphie B.m.b.H., Berlin-Schöneburg, (Development of plugs, sockets and R/F connections).

PB 36918. HEGANNO, E. PAUL and others. Causes of cleavage fracture in ship plate: Hatch corner tests. Progress report, Sep 1, 1945 - Mar 1, 1946. Jul 1946. 77 p. Price: Microfilm-$2.00 - Photostat-$6.00
A program of research was undertaken by the University of California to determine the causes of cleavage fracture in ship plate as influenced by design and metallurgical factors. In previous reports, 1 and 2, accounts were given of the development of a hatch corner type specimen which contained a corner which had considerable restraint to plastic flow. Prior to Sept 1, 1945 thirteen of these large specimens were constructed and tested. This report covers further tests made on six additional full scale hatch corner type specimens and an investigation of the effect of preheating upon the hardness of welds and the adjacent heat affected zone. The report contains photomicrographs, photographs, tables, drawings, graphs and tabulated data.

PB 19637. GERMANY. REICHSFORSCHUNGSRAT. Brief progress reports on various research projects. (ALSOS Mission, RFR 506) Oct 1944. 10 p. Price: Microfilm-$50¢ - Photostat-$1.00
The studies mentioned in these progress reports include investigations of the Raman effect, the secret report on azides for the German Army by Dr. Ludwig Kahovic, a report of "no progress" on a study of mixed catalysts undertaken by Prof. Rinacher, director of the Chemisches Institut at Rostock University; a semi-annual report by Dr. R. Seke, of Graz, on the preparation of benzylenes, and the announcement by the Crude Oil Division of Vakuum Oil A. G. of the development of a new plant for removal of water from crude petroleum. In addition, a report by Dr. Stauff mentions a new differential sedimentograph. E. Reuleaux, professor of transportation at the Technische Hochschule in Darmstadt, reports on studies of oil pipeline construction costs, and Dr. Correns, of Gottingen, reports briefly on the progress of studies of porosity and permeability. In German. The information contained is of administrative rather than scientific nature.

PB 13332. GERMANY REICHSFORSCHUNGSRAT.. List of research projects. (ALSOS RFR 707 (Part #3) 1944. 148 p. Price: Microfilm - $1.50 - Photostat - $10.00
This folder lists several hundreds of research projects by title only in the fields of general and inorganic chemistry, organic chemistry, agriculture and general biology, medicine, veterinary medicine, fibers, mineral oils, electrical engineering, construction of machines, food technology, physics, geography, forestry and wood, geology, etc.

PB 19454. GERMANY. REICHSFORSCHUNGSRAT. Short progress reports on miscellaneous research projects. (ALSOS Mission RFR 507) May-Dec 1944. 51 p. Price: Microfilm-$1.00 - Photostat-$4.00
This report contains 46 brief statements of the progress of research projects from various German research institutions, laboratories and individuals. Fuels, engines, physical chemistry, electronics and other fields are mentioned. Usually, the title of the project, together with a short outline of the experiments conducted, is given.

PB 30962. KLANGFILM G.M.B.H., GERMANY. Stereophony. (BIOS Halstead Exploiting Centre Rept 10333) May 1946. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
Stereophony signifies hearing of a true accoustic reproduction with two ears. The usual sound reproducing apparatus in theatres has only one single passage for reproduction and consequently permits only one-ear hearing. A two-ear true accoustic reproduction can be achieved by employing two passages in the transmitting channels, completely separated from one another, and each of which operates its microphone and amplifier. Attempts were then made to achieve true accoustic effects in the reproduction by loud speakers, by the use of two or more units which are fed by separate systems of reproduction. The picking up of the sound is achieved by directional microphones and by two separate and individually regulated amplifier ways. For recording on film, the 2 mm sound track is divided so that the tone recordings produced by two separately modulated light-ray control units of the two transmission ways are arranged besides each other. For reproduction in a theatre, the two halves of the sound track are explored by two separate photoelectric cells and the audio frequency alternating currents so produced are supplied to two separate amplifiers to the two loud speaker units. The arrangement may be one common deep-pitch loud speaker in the center of the theatre, and two high-pitch loud speakers at the sides. This represents an increase in naturalness and improvement in quality. It has not yet been put into practice because of the cost of reconstruction of the reproduction equipment, providing of two amplifier systems and the fitting of special types of light and sound apparatus with a double exploring device.

PB 34014. LONDON, R. C. and GILSON, J. C. German aircraft oxygen equipment. Jun 1948. (BIOS Final Rept 318, Item 8, 22, 27) Mar 1946. 25 p. Price: Microfilm-$1.00 - Photostat-$2.00
All the aircraft oxygen equipment for the German Air Force, except the high pressure bottles, was designed and developed at the Draeger Works. Work was carried out under general instructions from the Reichsluftfahrtministerium and in cooperation with the Erprobungsstelle at Rechlin. High pressure oxygen was obtained both from warm evaporators and high pressure transfer pumps. The oxygen was not dried, but by careful design and installation little trouble from freezing of equipment was encountered. All high pressure valves have a hard rubber (buna) insert seating on a brass cone. Risks of explosion have been met by careful design of the parts to ensure that heat generated by sudden compression of the gas is conducted away rapidly. All equipment had been designed to reduce the quantity of raw material in short supply, especially brass and natural rubber. The regulator diaphrams were made of balloon fabric from Allied propaganda balloons. A new oxygen mask modelled on the U.S.A.A.F. A.10 was being developed. Development on pressure suits had been carried out for a number of years with little success. The report also includes a list of reports and drawings filed at R.A.E.- Farnborough.

PB 33379. NEW JERSEY ZINC COMPANY OF PENNSYLVANIA. Two interim reports on luminescent materials: Report no. I. Usefulness of luminescent markings in the unloading of a ship under blackout conditions: Feb 4, 1943, by C. E. Barnett; Report no. II. Visual thresholds at low brightness, by L. J. Reimert. Progress report, Jan 26 - Feb 26, 1943. (OSRD Rept 2021) Feb 1943. 32 p. Price: Microfilm-$1.00 - Photostat-$3.00

In conjunction with a training program for stevedores and operators of amphibious vessels, the New Jersey Zinc Company of Pennsylvania made tests on luminescent materials, e. g., phosphorescent markers and radioactive buttons, which they applied to small boats and to various parts of a ship's landing gear, for the purpose of evaluating the usefulness of such luminescent materials in night loading of small boats from a supply ship. The tests, though unsatisfactory, because of ambient light and continuous rain, showed good phosphorescent marker visibility, even with poor daylight, and pointed the way to future work. In a second study the importance of total light output and distance as factors in the visibility of small luminous objects of a fixed color under dark-room conditions are summarized. The visibility or pick-up distance is solely determined by the total light output. Recognition distances for letters constructed with a stroke to size ratio of 1/5 are the same for luminous letters on a black background as for black letters on a luminous background. Pick-up distances in general, and recognition distances for multiple objects, are a maximum in the green. Visual acuity gradually increases from blue, to green, to red. The report has graphs and drawings.

PB 33265. SCHEFFÉ, HENRY. Theory of probability with applications. (NDRC Armor and Ordnance Rept A-224; OSRD Rept 1918) Feb 1944. 112 p. Price: Microfilm-$3.00 - Photostat-$8.00

This monograph outlines material on probability studies for operational analysis trainees and should be of value to research workers with a slight background in probability or statistics. The topics covered are: (1) Fundamentals; (2) discrete probability distributions; (3) continuous distributions; (4) study and critique of the handbook for bombardiers; (5) advanced topics on discrete distribution; (6) sampling theory; (7) estimation by confidence intervals; and (8) tests of statistical hypotheses. There are a number of tables and curves and a list of selected references. The report was prepared at Princeton University.

PB 36129. SIMONS, FRANZ P. (Untersuchungen an diffusoren für überschallwindkanäle. (I teil) (Investigations in connection with diffusers for supersonic wind tunnels. First report). (Deutsche Luftfahrtforschung FB 1738) Jan 1943. 53 p. Price: Microfilm-$2.00 - Photostat-$4.00

This report from the "Aerodynamisches Institut der Technischen Hochschule Aachen" discusses three diffuser forms tested in a 12 x 8-cm supersonic wind tunnel. It is found that, with increasing Mach number, diffusers jointly comprising a converging and a diverging part show a greater pressure recovery than divergent diffusers.

PB 36018. U. S. BUREAU OF ORDNANCE. Glass-plastic-laminated: Specifications for glass for windows of fire control instruments. (NAVORD Specification 1252) Dec 1942. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00

The purpose of this specification is the procurement of high grade nonscatterable glass consisting of a layer of two pieces of glass separated by a thin transparent plastic filler and a layer of transparent plastic, the combination to be described as "plastic-laminated glass", of thickness not less than $\frac{1}{4}$ inch or exceeding $\frac{3}{8}$ inch, for use in the manufacture of windows for fire control instruments. Requirements are specified in detail.

PB 36048. U. S. BUREAU OF ORDNANCE. Molasses residuum (curbay binder). (NAVORD Specification 1134) Oct 1938. 5 p. Price: Microfilm - $1.00 - Photostat - $1.00

Detail requirements, methods of sampling, inspection and tests and packing are specified for a single grade of molasses residuum.

PB 34889. U. S. CLIMATIC RESEARCH LABORATORY, LAWRENCE, MASS. Auxiliary heating for handwear: Utility and efficiency of American, British and German hand warmers. (Rept 4565) Oct 1945. 28 p. Price: Microfilm-$1.00 - Photostat-$2.00

The performance of various fuel-type and water-type handwarmers was considered from the standpoints of efficiency, military utility and substitution of fuels. Two fuel-type warmers were tested. They failed to operate satisfactorily at temperatures of -10°F and were adequate at +20°F if the covers were removed. Comparison of three water-type warmers of American, British and German design was made. These contain a chemical agent which reacts on the addition of water. These operated satisfactorily at temperatures as low as -40°F, and were much easier to operate. The fuel-type warmer was considered unsatisfactory at its present stage of development. Appendices, as follows, are included: (1) List of agenda; (2) experimental data; (3) tables; and (4) photographs and graphs.

PB 36898. U. S. OFFICE OF MILITARY GOVERNMENT FOR GERMANY. FIELD INFORMATION AGENCY, TECHNICAL. List of industrial plants in the Bremen Enclave; prepared by the Statistical Office of German Industries, Industry Division. May 1945. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00

This list of German industries in the Bremen Enclave was compiled from a list prepared by the Statistical Office of German Industries, Industry Division, Office of Military Government for Germany (U. S.). The industries are listed according to Industry Groups in each Kreis (district). Where such information was available, the special industry code number, and the number of employees on May 1, 1945 are also given.

PB 36897. U. S. OFFICE OF MILITARY GOVERNMENT FOR GERMANY. FIELD INFORMATION AGENCY, TECHNICAL. List of industrial plants in the U. S. Sector of Berlin. May 1945. 117 p. Price: Microfilm-$3.00 - Photostat-$8.00

This list of industrial plants in the U. S. sector of Berlin was compiled from the records of the former German Ministry of Armaments and War Production (the Speer Ministry), and a list prepared by the Statistical Office Office of German Industries, Industry Division, Office of Military Government

for Germany (U. S.). The industries are listed according to Industry Groups in each Bezirk (district) in the U. S. sector of Berlin. Where such information was available, the special industry code number, as well as the number of employees on May 1, 1945, are also given.

PB 36899. U. S. OFFICE OF MILITARY GOVERNMENT FOR GERMANY. FIELD INFORMATION AGENCY, TECHNICAL. List of industrial plants in the U. S. Zone of Austria. n. d. 139 p. Price: Microfilm-$3.00 - Photostat-$10.00
This list of German industries in the U. S. zone of Austria is a compilation made from a list prepared by the Statistical Office of German Industries, Industry Division, Office of Military Government for Germany (U. S.). The industries are listed according to Industry Groups in each Kreis (district). Where information was available, the industry code number is also included.

PB 36779. U. S. QUARTERMASTER DEPOT, JEFFERSONVILLE, IND. Ropes for tentage. (Progress report no. 1). (Rept 108). Jan 1945. 15 p. Price: Microfilm-$1.00 - Photostat-$1.00
The purposes of the work reported herein were: (1) To compare the properties of treated and untreated ropes; (2) to compare the mildew resistance of jut ropes treated according to federal specification with jute ropes treated according to JQD specification; (3) to compare the properties of JQD specification lay ropes and federal specification lay ropes. Methods and procedures are described. It is recommended that the following rankings should be considered as subject to modification when results of long time exposures are complete and also when the wet shrinkage versus water absorption and modulus of elasticity at low loads are determined: (1) Cotton, solid braided; (2) cotton, twisted; (3) sisal, Mexican sisal, and sisal - American hemp blends; (4) jute. It is also recommended that all ropes for tentage applications should be treated according to the appropriate Jeffersonville specification; ropes which are to be spliced for tentage use should be tent lay as defined in Jeffersonville specifications; an investigation should be made of fastening devices which would eliminate the need of splicing and knotting; higher percent blends of American hemp and sisal, and other rope fibers be tested in this project. Table and photographs are shown, but table will not reproduce well.

PB 36699. U. S. WAR DEPARTMENT. Coordinate conversion tables (with Changes no. 1. Aug 1943). (Tech Manual 4-238) Mar 1943. 341 p. Price: Microfilm-$7.00 - Photostat-$23.00
The manual is divided into two sections. Table I gives the values of A sin X and A cos X, where X is in mils. The unit in which A is expressed will determine the unit of the entry-if A is in yards, the entries in this table are to be taken in yards. This table may be used to obtain the values of A sin X and A cos X for all values of A, correct to within a unit in the seconddecimal place. Table II gives the values of sin X and cos X to eight decimal places at intervals of one mil. This table may be used whenever higher accuracy than that afforded by Table I is desired. These tables have been computed by the Mathematical Tables Project of the Work Projects Administration for the City of New York, sponsored by the National Bureau of Standards.

PB 36215. U. S. WAR DEPARTMENT. Effect of cold weather on black gas mask facepieces and black gas mask hose; and methods for restoring pliability. (Tech Bulletin 3-205-15) May 1945. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
Methods are described for recognizing facepieces particularly liable to cold set, describes cold set, lists temperature changes under which cold set may occur, and suggests methods for restoring pliability. Black facepieces, made of reclaimed rubber, reprocessed rubber, or neoprene, are particularly suspect to cold set.

PB 36858. U. S. WAR DEPARTMENT. Handbook on German military forces. (Tech Manual E 30-451) Mar 1945. 626 p. Price: Microfilm-$13.00 - Photostat-$43.00
Total mobilization, in the sense of the complete and scientific control of all the efforts of the nation for the purposes of war, and total utilization of war as an instrument of national policy have been developed to their highest degree by German militarists. It is the purpose of this handbook to describe this military machine in all its aspects. The organization of the field forces and of other military and auxiliary groups is discussed. Although this volume is dated March 1, 1945, and consequently does not cover the full period of World War II, it presents a detailed exposition of the German Army's tactical doctrines, and of the doctrine and characteristics of their fortifications. The chapter on weapons is divided into sections headed, as follows: Small arms, mortars, artillery, self-propelled artillery, armored vehicles, rocket weapons, grenades and other weapons. The chapter on equipment comprises sections on automotive, artillery fire control, signal, engineer, chemical warfare and cooking equipment. The German Air Force, its chain of command, army and navy cooperation, equipment, training and tactics, are discussed in a separate chapter. Photographs of equipment, maps, tables, drawings and organization charts are included.

PB 36857. U. S. WAR DEPARTMENT. Handbook on Japanese military forces. (Tech Manual E 30-480) Oct 1944. 412 p. Price: Microfilm-$9.00 - Photostat-$28.00
The purpose of this handbook, which constitutes a revision of TM 30-480, September 21, 1942, is to give in a single publication the broad outlines as well as pertinent details of the organization, equipment, and training of the Japanese Army. A chapter is devoted to the Japanese air service. In addition, Japanese tactical doctrines and techniques, as set forth in their manuals and observed in action, are discussed. A list of military terms and their Japanese equivalents in Romaji (Romanized form of Japanese terms) and characters, which may be useful to unit intelligence officers, is given in chapter XIII. An appendix presents the following supplemental data: Japanese year dates; Japanese weights, measures and moneys; and method of numbering models of weapons and equipment. Photographs of equipment maps, tables, drawings and organization charts are included.

PB 36216. U. S. WAR DEPARTMENT. Mask, gas, dog, M6-13-8. (Tech Bulletin 3-205-6) Sep 1944. 5 p.
Price: Microfilm-$1.00 - Photostat-$1.00
The bulletin describes this mask provided for each tactical dog used by the armed forces in theaters of operation including training the dog to wear the mask. A photograph is included.

PB 36218. U. S. WAR DEPARTMENT. Mask, gas, head-wound, M7-11-9. (Tech Bulletin 3-205-5) Sep 1944. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The bulletin describes this mask designed for personnal unable to wear the service gas mask because of wounds of the head, jaw, or neck, since bandages of such wounds would make it impossible to adjust the service mask or might cause channels in the gasproof seal of the service mask. Photographs are included.

PB 36217. U. S. WAR DEPARTMENT. Mask, gas, service, snout type, M8-11-10. (Tech Bulletin 3-205-14) May 1945. 20 p. Price: Microfilm-$1.00 - Photostat-$2.00
The purpose of this bulletin is to acquaint military personnel with characteristics and use of this mask designed for use by assault troops. The mask consists of a facepiece canister, and carrier, and weighs approximately 3 pounds. The canister is attached to the front of the facepiece by means of a canister mounting adapter, no hose being used. Numerous photographs are included.

PATENTS

German patents listed by German patent number are available in photostatic copies at the rate of 20¢ a page. Orders may be sent to the U. S. Patent Office, Washington 25, D. C.

German patent applications listed by PB Report number are available from the Office of Technical Services at the prices stated for each.

CHEMICALS AND ALLIED PRODUCTS

GER. PATENT 729185. AKTIENGESELLSCHAFT VORMALS ŠKODAWERKE, PILSEN, UND GREGOR, EUGEN. Verfahren und vorrichtung zur rücklaufbildung und destillatkühlung bei verstärkungssäulen (Method and apparatus for refluxing and cooling the distillate) Application A 92923 IVa/12a, Feb 15, 1941. Original inventor: Gregor. Dec 11, 1942. 5 p.
A cooling system to be used in connection with a fractionating column is described and illustrated by a flow sheet. That portion of the vapor leaving the top of the column which is necessary to provide the desired amount of reflux is cooled separately from the remainder. The reflux condenser and the main condenser are interconnected in such a manner as to provide for a constant reflux volume.

GER. PATENT 710491. ASAHI-BEMBERG KENSHI KABUSHIKI-KAISHA, OSAKA. Verfahren zur abscheidung eines bestandteiles (Process for the separation of a component). Application A 86892 IVa/12a, May 19, 1938. Original inventor: Munekata. Sep 15, 1941. 4 p.
The invention described in this document deals with the separation of a component from a fluid mixture by evaporation and treatment of the vapor with a special absorbent. The latter absorbs the one component of the fluid mixture to be separated. A drawing is included.

GER. PATENT 706892. BAUMGARTEN, PAUL UND DORNOW, ALFRED (Inventors). Verfahren zur herstellung von in 6-stellung nicht substituierten β-derivaten des pyridins. (Process for preparation of β-derivatives of pyridine which are not substituted in 6-position). German patent application B181699 IVe/12p, Feb 1, 1938. Jun 3, 1941. 2 p.
Products which can be used as medicinals are obtained by reacting the diethyl acetal of unsubstituted malonic aldehyde with ammonia compounds of ketones of the general formula $R' . CO . CH_2 R'' . R'$ is an optional hydro-carbon group, R" is an activating group. The reaction takes place by heating with or without use of solvents. In German.

GER. PATENT 720405. BEIERSDORF (P.) & Co. A.G., HAMBURG. Verfahren zur herstellung von ureiden und amiden substituierter essigsäuren. (Preparation of ureides and amides of substituted acetic acids). Application D183200 IVe/12o, May 20, 1938. Original inventor: Ruhkopf May 5, 1942. 3 p.
Hydrolysis of 5,5' substituted barbituric acid to form the corresponding acetic acid ureide or amide takes place in comparatively short time, by heating a water solution of the barbituric acid derivative under pressure and in the presence of neutral salts of strong acids.

GER. PATENT 722466. BÖHME FETTCHEMIE G.M.B.H., CHEMNITZ Verfahren zur herstellung von schwefelsäureestern aus olefinen. (Production sulfuric acid esters from olefins). Application B189704 IVd/12o, Jan 27, 1940. Original inventor: Baumgarten. Jul 10, 1942. 2 p.
Sulfonation of higher molecular weight olefins (8 to 20 carbon atoms) is accelerated by the addition of small amounts of formaldehyde or polymers thereof. The reaction is carried out rapidly and under cooling.

GER. PATENT 722563. BRAUNKOHLE-BENZIN A.G., BERLIN Verfahren zur aufarbeitung von verbrauchten kontakten für die kohlenoxydhydrierung. (Method of spent catalyst recovery in the carbon monoxide hydrogenation) Application B186478 IVd/12o, Mar 22, 1939. Original inventors: Klein and Meyer. Jul 14, 1942. 2 p.
The cobalt-thorium-magnesium oxide catalyst used in the carbon monoxide hydrogenation is recovered by leaching the metal salts from their carrier with sulfuric acid and subsequent precipitation of the thorium as thorium potassium sulfate and of cobalt as the carbonate.

GER. PATENT 715540. CHEMISCHE FABRIK JOH. A. BENCKISER G.M.B.H., LUDWIGSHAFEN. Verfahren zur herstellung von stickstoffphosphorsäureverbindungen. (Method of preparation of nitrogen-phosphoric acid compounds). Application C54804 IVe/12o, Feb 22, 1939. Original inventor: Watzel Dec 23, 1941. 2 p.
Compounds of an undefined structure containing nitrogen and phosphorus, are obtained by reacting urea with pyro-, poly- or meta-phosphoric acid. The products are useful as water softeners and in the textile industry.

GER. PATENT 729186. CHEMISCHE FABRIK VON HEYDEN A.G., RADEBEUL. Verfahren zur herstellung von basischem komplexen thorium-natriumtartrat. (Preparation of complex basic thorium-sodium tartrate) Application C86486 IVd/12o, Jun 27, 1940. Original inventor: Gebauer. Dec 11, 1942. 2 p.
Thorium tartrate is heated with sodium hydroxide (in the proportion of 3 molecules of ThO_2 to 5 molecules of NaOH). Upon the addition of a suitable organic solvent (for example methyl alcohol) the complex basic thorium-sodium tartrate is precipitated. It is useful as a contrast medium in X-ray photography.

GER. PATENT 720686. CHEMISCHE FORSCHUNGSGESELLSCHAFT M.B.H., MUNICH. Verfahren zur herstellung von vinylhalogeniden. (Production of vinyl halides) Application C49715 IVd/12o, Oct 10, 1934. Original inventors: Berg and Kalb. May 13, 1942. 2 p.
It was found that a more efficient polymerization of vinyl chlorides takes place, when the acetylene, used in the production of the vinyl chloride to be polymerized, is supplied in the commercial, nonpurified form. The raw acetylene is preferably obtained from calcium carbide and water or steam, and subjected to drying only.

GER. PATENT 719942. CONSORTIUM FÜR ELEKTROCHEMISCHE INDUSTRIE G.M.B.H., MUNICH. Verfahren zur herstellung von essigsäureanhydrid. (Production of acetic anhydride) Application C50099 IVd/12o, Jan 17, 1936. Apr 20, 1942. 4 p.
This is an elaboration of patent No. 687065 on the continuous production of acetic anhydride from acetic acid and ketene. A flow sheet of the installation is enclosed.

GER. PATENT 729344. DEUTSCHES REICH, REICHSMONOPOLVERWALTUNG FÜR BRANNTWEIN, BERLIN. Verfahren zum löslichmachen von alkaliunlöslichem, isoliertem lignin (Method of dissolving isolated lignin, insoluble in alkali). Application R 110344 IVc/120, Oct 30, 1938. Original inventor: Karsch. 3 p.
Isolated lignin obtained by the manufacture of sugar from wood by the Scholler-Tornesch method, is brought into solution by reaction with sodium or potassium hydroxide at a temperature of 120° to 220°C. The product thus obtained is useful as a tanning agent.

GER. PATENT 722463. DONAU-CHEMIE A.G., VIENNA. Verfahren zur herstellung von hexachloräthan und gemischen desselben mit perchloräthylen. (Production of hexachloroethane and mixtures thereof with perchloroethylene). Application D81184 IVd/12o, Sep 10, 1940. Original inventor: Frühwirth. Jul 13, 1942. 4 p.
A one-step process is described by which mixtures rich in hexachloroethane are produced by burning acetylene with an excess of chlorine. A drawing of the apparatus is included.

GER. PATENT 715197. FAUDI, FRITZ. Stützringe zum festlegen der filtermittel und zur führung der flüssigkeit in filtervorrichtungen mit stockwerkartig übereinander angeordneten filterkammern (Supporting rings for tier-type filters). Application F 85374 IVb/12d, Jul 24, 1938. Original inventors: Croseck and Borck. Dec 16, 1941. 2 p.
Elastic rings with a V-shaped cross section hold the filter cloth in place and provide for equal spacing of the filter components.

GER. PATENT 706563. GESELLSCHAFT FÜR LINDE'S EISMASCHINEN A.G., HÖLLRIEGELSKREUTH. Verfahren zum ausgleich von schwankungen in der zusammensetzung des rohgases bei der zerlegung von gasgemischen in mehreren stufen bei gleichzeitiger erzielung konstanter temperaturen im rektifizierapparat. (Process for offsetting fluctuations in the composition of crude gas during multistage separation of gas mixtures, while simultaneously maintaining constant temperatures in the rectification apparatus). German patent application G90484 IVa/12a, May 22, 1935. May 2, 1941. 4 p.
The process, described in this document and illustrated by a flow sheet, is applicable to various gas mixtures.

GER. PATENT 712553. HANNEMANN KOM.-GES., BERLIN-FROHNAU. Vorrichtung zur spülung der schwimmereinrichtung von verdampfern o. dgl. (Appliance for rinsing float devices in evaporators and the like) German patent application H158015 IVa/12a, Dec 14, 1938. Original inventor: Weisheit. Oct 21, 1941. 5 p.
This rinsing device has the purpose of cleaning the entire regulator or control float appliance of an evaporator in such models where the float apparatus is arranged outside the evaporator. Above the float container a condenser is installed, which communicates with the vapor space of the evaporator. The condensate is conducted into the float container, where it cleans the float apparatus without interfering with its action. In certain designs the pressure-balancing piping between the float appliance and the vapor space of the evaporator is fitted with a cooling surface. The piping is divided into two branches, one branch conveying the condensate into the float appliance the other opening into the upper part of the latter for pressure equalization. In those designs where the fluctuations of the float are transmitted to the feed valve through a lever and connecting system, the condensate is introduced into the float container through the opening provided for the lever. Additional devices allow a complete drainage of the float container. Diagrams are included.

GER. PATENT 724297. HENKEL & CIE, G.M.B.H., DÜSSELDORF. Verfahren zur aufarbeitung von glycerinpechen. (Utilization of glycerine residues). Application H154517 IVd/12o, Jan 29, 1938. Original inventor: Kapitel. Aug 29, 1942. 2 p.
Glycerine, di- and polyglycerine, contained in the usually discarded residue of conventional glycerin production, may be recovered by the method described. They are converted, after extraction from the residue, into the corresponding halohydrins with the aid of hydrogen chloride or bromide and the catalytic action of organic acids. The halohydrins produced are used as intermediates in the preparation of various glycerine derivatives.

GER. PATENT 715112. HENKEL & CIE, G.M.B.H., DÜSSELDORF Verfahren zur darstellung von im säurerest substituierten estern. (Preparation of esters, substituted in the acid radical). Application H129740 IVe/12o, Dec 6, 1931. Original inventors: Lübbert and Müller. Dec 17, 1941. 3 p.
A group of valuable compounds is obtained by esterification of hydroxy- or mercapto- fatty acids, which are alkylated, cyclo alkylated or arylated on the oxygen or sulphur respectively, with resinous or naphthenic compounds, containing one or more hydroxyl or mercapto groups and a minimum of 12 carbon atoms. These compounds are usable as emulsifiers, softeners, in the perfume industry and as basis for other syntheses.

GER. PATENT 716049. HOENING, HEINZ JR. (Inventor). Anpressvorrichtung für endlose kuchenabnahmebänder von filtervorrichtungen mit umlaufender filterfläche (Pressure application for the removal of filter cake). Application H 159749 IVb/12d, Dec 8, 1937. 3 p. Jan 12, 1942.
Removal of the filter cake from rotary drum-type filter presses is accomplished with the aid of a continuous band which is pressed against the drum surface during a part of its rotation. The device described and illustrated provides for adjustment and variation of the band against the drum.

GER. PATENT 724245. I. G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung trocknender öle. (Production of drying oils) Application I57687 IVd/12o, Apr 14, 1937. Original inventors: Smeykal and Krämer. Aug 25, 1942. 3 p.
Oils of light color and of drying characteristics approaching those of linseed oil, are produced by the reaction of phosgene and aluminum chloride with liquid aliphatic or hydroaromatic hydro-carbons. The oils used as raw materials for this process are obtained by catalytic hydrogenation of coal or tar.

GER. PATENT 714312. I.G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von acetylenkalium. (Method of preparation of potassium acetylide) Application I60943 IVd/12o, Mar 27, 1938. Original inventor: Lange. Nov 27, 1941. 2 p.
Anhydrous potassium hydroxide may be used in place of metallic potassium for the preparation of potassium acetylide. Reaction takes place in liquid ammonia at low temperature.

GER. PATENT 719598 I. G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von aromatischen sulfohalogenidsulfonsäuren (Preparation of sulfonic acids of aromatic sulfohalides) Application I57992 IVd/12o, May 14, 1937. Original inventors: Nieg and Wiemers. Apr 20, 1942. 3 p.
Sulfonation of aromatic sulfochlorides is described. Concentrated sulfuric acid either oleum or monohydrate, are used as sulfonating agents; the sulfonic acids are crystallised by salting out or cooling.

GER. PATENT 720467. I.G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von benzanthronen. (Preparation of benzanthrones) Application I64232 IVe/12o, Mar 30, 1939. Original inventors: Hrubesch and Schlichting. May 7, 1942. 4 p.
Benzanthrones are prepared by reacting inorganic or organic esters of anthrahydroquinone with unsaturated aldehydes, such as α-methylacrolein, crotonaldehyde and others. Dilution with acids or organic solvents is necessary.

GER. PATENT 722731. I. G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von butadien. (Production of butadiene) Application I57890 IVd/12o, May 4, 1937. Original inventors: Stadler and others. Jul 27, 1942. 3 p.
Partial hydrogenation of monovinyl acetylene to butadiene is accomplished by reaction with hydrogen in the nascent state, obtained by the decomposition of alkali - mercury amalgam with water.

GER. PATENT 720316. I.G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von butadien. (Production of butadiene). Application I61890 IVd/12o, Jul 13, 1938. Original inventors: Müller and others. May 4, 1942. 3 p.
The known method of butadiene production by catalytic removal of hydrogen chloride from n-butylene chloride is modified. Vapors of 20% hydrochloric acid are used as the diluting agent for n-butylene chloride. The advantage resulting therefrom consists in the formation of concentrated HCl as byproduct, in place of the diluted acid obtained by oil methods. The reaction takes place at 500 to 700°C and in the presence of catalysts and steam.

GER. PATENT 714314. I. G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von cyclohexenonen. (Method of preparation of cyclohexenones). Application I61726 IVe/12o, Jun 26, 1938. Original inventors: Ebel and Pesta. Nov 27, 1941. 2 p.
Cyclohexenones are prepared by reaction in the vaporphase of methyl vinyl ketone with acetone or methyl ethyl ketone, in the presence of metallic oxides.

GER. PATENT 722337. I.G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur darstellung von estern. (Preparation of esters) Application I64155 IVd/12o, Mar 22, 1939. Original inventor: Meiser. Jul 9, 1942. 2 p.
Esters of p-nitro benzoic acid and cyclo hexanol or guaiacol are useful in the therapy of streptococcus and pneumococcus infections. Compounds of equal effect are found in the esters of p-nitrobenzoic acid or p-nitrothiobenzoic acid with an aliphatic alcohol or mercaptan with six or more carbon atoms. Various methods for the preparation of these compounds are described.

GER. PATENT 719375. I.G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von flüssigen kohlenwasserstoffen. (Preparation of liquid hydrocarbons) Application I44241 IVd/12o, Apr 17, 1932. Original inventor: Feiler. Apr 8, 1942. 2 p.
Heating of methane and other gaseous hydrocarbons over 800°C. in the presence of oxygen results in the formation of liquid compounds. Excessive carbon deposition in the apparatus is avoided by the addition of 5% of oxygen to the gas stream.

GER. PATENT 715322. I. G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von metallsalzen der sulfitablauge. (Preparation of metalsalts of waste sulfite liquor) Application I 63062 IVd/12o, Dec 4, 1938. Original inventors: Rieche and Rudolph. Jan 29, 1942. 3 p.
It was found that the insoluble salts of zirconium and calcium of liquior-sulfonic acid are quite useful as tanning agents, either alone or in connection with organic tanning compounds. Preparation and use of these salts is described.

GER. PATENT 714311. I. G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von niedrigmolekularen N-alkylierten fettsäureamiden. (Method of preparation of N-alkylated fatty acid amides of low molecular weight) Application I58623 IVd/12o, Jul 24, 1937. Original inventors: Seidler and Klein. Nov 26, 1941. 4 p.
An especially designed fractionating column is described in which esters of fatty acids and alcohols are reacted with primary or secondary alkyl amines, all reactants being of low molecular weight. Reaction takes place in the heated top compartment; the temperature in the lower part of the column is held within such limits that condensation of the amide takes place, whereas the alcohol formed remains vaporized and is removed through a side stripper.

GER. PATENT 716507. I. G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von organischen goldverbindungen. (Method of preparation of organic gold compounds) Application I53531 IVd/12o, Oct 31, 1935. Original inventors: Bookmühl and Ehrhart. Jan 24, 1942. 2 p.
Aqueous solution of organic disulfides are reacted with inorganic gold salts and the organic gold compounds are precipitated by the addition of certain solvents. The gold compounds in question are useful in the therapy of syphilis and tuberculosis.

GER. PATENT 714310. I.G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von oxalsäure neben anderen organischen stoffen durch oxydation kohlenhydrathaltiger stoffe mit salpetersäure. (Process for the preparation of oxalic acid and other organic substances by oxidation of carbohydrate containing material with nitric acid). Application I62399 IVd/12o, Sep 7, 1938. Original inventor: Weitzel. Nov 26, 1941. 3 p.
By heating peat, preferrably with a water content of 38%, with 50% nitric acid to 60-70°C for several hours, oxalic acid is formed. The nitric and nitrous oxides resulting are mixed with air and utilized for pre-treating the next batch of peat to be oxidized.

GER. PATENT 722204. I.G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von oxyketonen. (Preparation of ketone alcohols) Application I65475 IVc/12o, Aug 19, 1939. Original inventors: Mühlhausen and others. Jul 7, 1942. 2 p.
Dehydrogenation of 1,3-butylene glycol under normal pressure and at increased temperature, results in the formation of the corresponding ketone alcohol, 3-keto butanol. The catalyst necessary for this reaction is obtained by the decomposition of cuprie formate with hydrogen.

GER. PATENT 722466. I.G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur herstellung von vinylestern. (Production of vinyl esters). Application I62224 IVd/12o, Aug 14, 1938. Original inventors: Reppe and Wolff. Jul 10, 1942. 2 p.
An existing patent (No 588352) covers the catalytic production of vinyl esters from acetylene and fatty acids. This extension describes the use of tall oil as raw material for the same process. The impurities present have no poisoning effect on the cadmium and zinc catalyst and the reaction takes place at normal pressure. The vinyl esters obtained may be subjected to polymerization or used in monomeric form as drying oils in paints.

GER. PATENT 713627. I. G. FARBENINDUSTRIE AKT.-GES., FRANKFURT AM MAIN. Verfahren zur herstellung wachs- oder vaselineartiger stoffe. (Preparation of waxy and vaseline-type substances) Application I59857, IVd/12o, Nov 11, 1937. Original inventors: Schwarte and Jahrstorfer. Nov 12, 1941. 4 p.
The distillation residue of synthetic or natural fatty acids, is heated in the presence of catalysts favoring the splitting-off of CO_2, with subsequent or pretreatment with hydrogen under pressure. The resulting waxy substances have valuable technical properties.

GER. PATENT 716183. I.G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur kontinuierlichen herstellung von hauptsächlich aus monovinylacetylen bestehenden polymerisationsprodukten des acetylens. (Method of continuous production of acetylene polymers, containing chiefly of monovinylacetylene). Application I55316 IVd/12o, Jun 24, 1936. Original inventors: Stadler and Haberl. Jan 14, 1942. 5 p.
An existing process for the synthesis of monovinylacetylene is modified by re-routing the gas stream and refluxing. A schematic flow sheet is enclosed.

GER. PATENT 721253. I. G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur reinigung technischer zinklaugen (Purification of technical zinc solutions). Application I 57624 IVb/12n, April 4, 1937. Original inventors: Wolski and others. May 30, 1942. 2 p.
Salts of the alkaline earths are removed from zinc solutions (in the manufacture of zinc white) by precipitation with hydrofluoric acid or water soluble fluorides.

GER. PATENT 714313. I.G. FARBENINDUSTRIE A.G., FRANKFURT AM MAIN. Verfahren zur Überführung des vitamins D_2 in eine stabile form. (Method for the conversion of vitamin D_2 into a stable form). Application I62955 IVc/12o, Nov 23, 1938. Original inventor: Linsert. Nov 27, 1941. 2 p.
Vitamin D_2 is converted into a stable, more easily precipitated state, by forming a double compound with cholesterol or hydrogenated sterols. The components are dissolved in acetone and precipitated by the addition of water.

GER. PATENT 720628. KLEINERT, HERBERT (Inventor) Verfahren zur herstellung von umwandlungsprodukten von torf und von braunkohle. (Production of conversion products of peat and brown coal) Application I58223 IVc/12o, Jun 9, 1937. May 20, 1942. 2 p.
Emulsifying agents, suitable for use in road building materials are obtained by treatment of peat or brown coal with alkali under pressure, aerated with ozone and extracted with organic solvents.

GER. PATENT 722261. KLEINERT, HERBERT (Inventor) Verfahren zur herstellung von umwandlungsprodukten von torf und von braunkohle. (Production of conversion products from peat and brown coal) Application K153668 IVc/12o Mar 3, 1939. Jul 7, 1942. 2 p.
The process described in patent No. 720628 is simplified by rearranging certain steps.

GER. PATENT 714149. KOPP (RUDOLPH) & CO. CHEMISCHE FABRIK AKT.-GES., OESTRICH. Verfahren zum entwässern von alkalilauge enthaltender cellulose. (Process for the dehydration of cellulose, containing alkali hydroxide). Application K152719 IVc/12o, Dec 11, 1938. Original inventor: Klapproth. Nov 22, 1941. 2 p.
Dehydration of alkali hydroxide soaked cellulose may be accomplished at room temperature and without the commonly resulting "aging" effect. Water soluble ketones (especially aceton) insoluble in alkali hydroxides are used as extracting agents.

GER. PATENT 720685. MANNESMANNRÖHREN-WERKE, DÜSSELDORF. Kontaktofen für die synthese von kohlenwasserstoffen. (Catalyst furnace for the synthesis of hydrocarbons). Application M 140068 IVd/12o, Dec 4, 1937. Original inventor: Schappel. May 13, 1942. 3 p.
A rectangular device is described which supports the catalyst and efficiently cools the catalytic reaction of the Fischer-Tropsch process. The pipes carrying the cooling liquid are connected with each other and the walls of the vessel by a number of metal fins. The metal fins have the dual purpose of assisting in the efficient heat exchange and of strengthening the apparatus.

ELECTRICAL MACHINERY, EQUIPMENT, AND SUPPLIES

Electronics

GER. PATENT 731345. KÖRTING-RADIO-WERKE OSWALD RITTER, LEIPZIG. Schwingspule für elektrodynamische schwingungswandler. (Voice coil for electromagnetic transducers). Application K160986 VIIIa/21a2, May 3, 1941. Original Inventor: Patloka. Feb 8, 1943. 3 p.
A shock-proof voice coil form for loudspeakers which is made up of several layers laminated together. Drawing included.

GER. PATENT 732249. LORENZ (C.) A.G., BERLIN-TEMPELHOF. Verfahren zur verstärkung von in der spannung stark unterschiedlichen impulsen grosser flankensteilheit. (Procedure for the amplification of pulses with sharp edges and differing greatly in voltage amplitude.) Application L89260 VIIIa/21a2, Nov 27, 1935. Feb 25, 1943. 3 p.
An amplifier especially intended for television purposes. Curves included.

GER. PATENT 730675. SIEMENS UND HALSKE A.G., BERLIN-SIEMENSSTADT. Schaltungsanordnung zur linearisierung einer röhre mit steuergitter und einem oder mehreren hilfsgittern. (Circuit for making the characteristics of a tube with one control grid and one or more auxiliary grids more linear). Application S136673 VIIIa/21a2, Apr 7, 1939. Original inventors: Jacobi and Grassl. Jacobi and Grassl. Jan 15, 1943. 4 p.
A circuit which uses an extra stage for the purpose of automatically supplying a voltage of the correct magnitude to the screen grid of the first tube in order to effect a more linear Eg-Ip characteristics of the first stage. Curve and schematic included.

PB 11046. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Abstimmvorrichtung für lecherleitungsschwingkreise für ultrakurzwellen (Tuning arrangement for Lecher resonant circuits for ultra short waves). German patent application T60386 dated Apr 19, 1944. Inventor: Urtel. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
A resonant circuit in which the shorting bar consists of a rotatable metallic roller. Drawing missing.

PB 12220. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Anordnung zur strahlschwenkung bei einem richtantennensystem (Arrangement for lobing with a directional antenna system). German patent application T 60895 dated Aug 31, 1944. Inventor: Schütz. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
A mechanical lobing system in which antenna and reflector deflections are 180 degrees out of phase at all times. Illustrations missing.

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